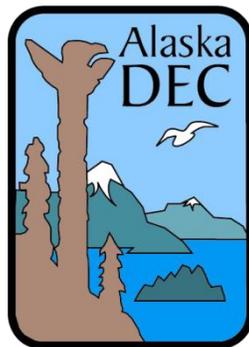


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**Alaska's  
Final  
2010 Integrated Water  
Quality Monitoring and  
Assessment Report  
July 15, 2010**

**Alaska  
Department of Environmental Conservation**



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## List of Abbreviations and Acronyms

µg/L	micrograms per liter
AAC	<i>Alaska Administrative Code</i>
ACWA	Alaska Clean Water Actions
ADF&G	Alaska Department of Fish and Game
APDES	Alaska Pollutant Discharge Elimination System
ARWA	Alaska Rural Water Association
ATTF	Alaska Timber Task Force
BEACH	Beaches Environmental Assessment and Coastal Health
BMP	best management practice
BOD5	5-day biochemical oxygen demand
BTEX	benzene, toluene, ethylbenzene, and xylenes
DEC	Alaska Department of Environmental Conservation
CBS	City and Borough of Sitka
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cfs	cubic feet per second
cm	centimeter
CWA	Clean Water Act
CWS	Community Water System
CZARA	Coastal Zone Act Reauthorization Amendments
DNR	Alaska Department of Natural Resources
DO	dissolved oxygen
DRO	diesel-range organics

DWP	Drinking Water Protection
EPA	U.S. Environmental Protection Agency
FC	fecal coliform
GP	General Permit
GPS	global positioning system
GRO	gasoline-range organics
LTF	log transfer facility
LSA	log storage area
MCL	maximum contaminant level
mgd	million gallons per day
ml	milliliter
NCA	National Coastal Assessment
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NTNCWS	Non-transient, Non-community Water System
PAH	polynuclear or polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
PWS	public water system
PWSS	Public Water System Supervision
QAPP	quality assurance project plan
ROD	record of decision
SDWA	Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System
SFY	State Fiscal Year

SPAR	DEC's Division of Spill Planning and Response
STORET	STOrage and RETrieval, an EPA environmental database
SVE	soil vapor extraction
TAH	total aromatic hydrocarbon
TCE	trichloroethylene
TDS	total dissolved solids
TMDL	total maximum daily load
TNCWS	Transient Non-community Water System
TOC	total organic carbon
TSAIA	Ted Stevens Anchorage International Airport
TSS	total suspended sediment
UIC	underground injection control
USACE	U.S. Army Corps of Engineers
USF&WS	U.S. Fish and Wildlife Service
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
WFLHD	Western Federal Lands and Highway Division
WPMP	Wellhead Protection Management Plan
WQS	water quality standards
WSA	Wadeable Streams Assessment
ZOD	Zone of Deposit

# 1 Introduction

## The Purpose of the 2010 Integrated Water Quality Assessment Report

The Clean Water Act (CWA) mandates that each state develop a program to monitor and report on the quality of its surface and groundwaters and prepare a report describing the status of its water quality. The U.S. Environmental Protection Agency (EPA) then compiles and summarizes the information and sends this information in a report to Congress. The process for developing information on the quality of the nation's water resources is contained in several sections of the CWA. Most prominent are Section 305(b), which requires that the quality of all waterbodies be characterized, and Section 303(d) which requires that states list any waterbodies that do not meet water quality standards (WQS). The Alaska WQS are documented in Title 18, Chapter 70, of the *Alaska Administrative Code* (18 AAC 70). EPA has recommended that the Section 305(b) reports and the Section 303(d) list of impaired waters be integrated into a single, comprehensive monitoring and assessment report, the Integrated Water Quality Monitoring and Assessment Report (Integrated Report).

This integrated approach allows each state to identify any water quality problems, develop remediation plans, and ultimately, achieve WQS in all of its waters. The Alaska Department of Environmental Conservation (DEC) considers the Integrated Report an important tool for understanding the health of Alaska's waters and identifying actions that can be taken to improve water quality in Alaska. Water quality information is one component that contributes to the efforts and priorities under the Alaska Clean Water Actions (ACWA) initiative, a much broader and more comprehensive assessment that includes water quality, water quantity, and aquatic habitat. More detailed descriptions of the ACWA initiative and its process for assessing information and establishing waterbody priorities are available in Section 2 and Appendix F.

The 2010 Integrated Report is a statewide water quality assessment. It describes whether the existing condition of each Alaska waterbody is sufficient to maintain multiple designated uses of that waterbody. Alaska WQS designate seven uses for fresh waters (drinking water; agriculture; aquaculture; industrial; contact recreation; non-contact recreation; and growth and propagation of fish, shellfish, other aquatic life, and wildlife) and seven uses for marine waters (aquaculture; seafood processing; industrial; contact recreation; non-contact recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting raw mollusks or other raw aquatic life for human consumption). Sources of information used by DEC to develop the biannual water quality assessment include monitoring data (e.g., water testing), professional knowledge, and evaluations such as those provided by water resource managers, fish and wildlife biologists, and aquatic biologists.

This Integrated Report fulfills the CWA Section 305(b) requirement that each state provide a comprehensive report of water quality to EPA. The report documents a comprehensive evaluation of the

1. Introduction—Purpose and Approach

status and health of each waterbody in the State of Alaska and describes state programs for maintaining or improving the quality of Alaska's waters.

In addition, this report describes the process for evaluating whether waterbodies attain WQS or are impaired (polluted). This process includes classifying each waterbody according to five categories, depending on their health; determining which waterbodies need further action; scheduling when each impaired waterbody will be addressed; involving the public in determining how water quality will be addressed; and determining how waterbodies are removed from the impaired waterbody list.

DEC water quality programs are described in Appendix F.

## Assessment Results

Alaska is rich in water quantity, water quality, and aquatic resources; almost half of the total surface waters of the United States are located within the state. Because of the size, sparse population, and remote character of Alaska, the vast majority of its water resources are in pristine condition. More than 99.9% of Alaska's waters are considered unimpaired. Among the state's vast water resources are more than 3 million lakes, 714,000 miles of streams and rivers, 44,000 miles of coastline, and approximately 174,683,900 acres of wetlands. Less than 0.1% of these water resources have been identified as impaired. Historically, Alaska's water quality individual assessments have focused on areas with known or suspected water quality impairments. Appendix A provides detailed information about the individual assessments and Appendix F provides information about the probabilistic assessment program. The table below provides information about Alaska.

**Table 1: Alaska Quick Facts**

Atlas – Topic	Value	Value
State population		686,000 <sup>a</sup>
State surface area (square miles)		656,425
Total miles of rivers and streams		714,004
Number of lakes/reservoirs/ponds		3,000,000+
Acres of lakes/reservoirs/ponds		12,787,200
Miles of coastal shoreline		44,000
<b>Wetland Acreages<sup>b</sup></b>		
Palustrine –non-tidal: muskegs, bogs, forested wetlands, tundra, open water	172,503,400	
Estuarine—bays, salt marshes, beaches	2,131,900	
Marine intertidal—ocean shoreline	48,600	
<b>Total wetland acres</b>		174,683,900
Notes:		
a. US Census Bureau National and State Population Estimates, September 2009 <a href="http://www.census.gov/popest/states/NST-ann-est.html">http://www.census.gov/popest/states/NST-ann-est.html</a>		
b. U.S. Fish and Wildlife Service, Cowardin Classification of Wetlands and Deepwater Habitat, 1979		

In Alaska, surface fresh water supplies three-fourths of water needed for industry, agriculture, mining, fish processing, and public water use and is used for about half of the domestic water supply. Alaska's surface waters include more than 15,000 salmon streams, an important resource for Alaskans and the world. Alaska also has the largest groundwater resources of any state.

## 1. Introduction—Purpose and Approach

Alaska is sparsely populated, having approximately 686,000 residents (approximately one resident per square mile). Urban development is concentrated in a few main population centers, and the majority of people live in Southcentral Alaska. The 2007-2008 U.S. Census showed population increased since the previous census in most areas of the state. Almost 50% of the state's population lives in the Municipality of Anchorage in Southcentral Alaska. The other major population centers are Juneau, the state capital, in Southeast Alaska, and Fairbanks in Interior Alaska. Communities outside these major population centers tend to be small and generally not connected by roads.

As population grows and the natural resource-based economy expands in Alaska, an increasing number of state waters, especially in urban areas, face the threat of degradation. In specific localized parts of Alaska, surface water quality has been impaired. Waters in urban settings (cities, towns, and villages) are predominantly impaired from sediment, turbidity, and fecal coliform (FC) bacteria contamination caused by urban and stormwater runoff. Other sources of impairment are sediment and turbidity from mining activities in Interior Alaska, residues from seafood processing facilities in coastal zones, contaminated military sites in Southcentral and Southwest Alaska, and bark and wood residues from timber processing and transfer facilities in coastal Southeast Alaska. Petroleum products, such as oil spills or fuel leaks, are also sources of impairment within the state.

### Waterbody Categories

Generally, waterbodies are assigned to categories by the degree to which water quality goals are attained. The five categories and three subcategories are described below:

- **Category 1.** All WQS for all designated uses are attained.
- **Category 2.** Some WQS for the designated uses are attained, but data and information to determine whether the WQS for the remaining uses are attained are insufficient or absent.
- **Category 3.** Data or information is insufficient to determine whether the WQS for any designated uses are attained.
- **Category 4.** The waterbody is determined to be impaired but does not need a total maximum daily load (TMDL).
  - **Category 4a.** An established and EPA-approved TMDL exists for the impaired water.
  - **Category 4b.** Requirements from other pollution controls have been identified to meet WQS for the impaired water.
  - **Category 4c.** Failure to meet a water quality standard for the impaired water is not caused by a pollutant; instead, the impairment is caused by a source of pollution such as nuisance aquatic plants, degraded habitat, or a dam that affects flow.
- **Category 5.** WQS for one or more designated uses are not attained and the waterbody requires a TMDL or recovery plan. Category 5 waters are those waters identified on the Section 303(d) list of impaired waters.

The following table summarizes the number of waterbodies in each category as determined by the evaluation of existing and readily available water quality data and information reviewed for this draft 2010 Integrated Report.

## 1. Introduction—Purpose and Approach

**Table 2: Number of Waterbodies**

Category	Number of Waterbodies
1	Majority of Alaskan waters
2	44
3	304
4a	33
4b	4
4c	0
5	28

## Alaska's Approach to Impaired Waterbodies

Alaska's process for listing an individual waterbody for failure to meet WQS, as required in the CWA Section 303(d), begins with an internal review of existing and new information to determine (1) the presence of pollutants, (2) whether persistent exceedances of WQS are occurring, (3) whether impacts on the designated uses are occurring, and (4) the degree to which WQS and the other criteria are attained. The specific criteria used for evaluation and listing of waterbodies associated with residue discharges from log transfer or seafood processing facilities are found in Appendixes G and I.

When a waterbody is placed on the Section 303(d) list, a TMDL or recovery plan is developed, unless data obtained after the listing indicate that the waterbody is no longer impaired or other measures are undertaken to restore the waterbody. State of Alaska waterbodies on the Section 303(d) list are scheduled for development of a TMDL (see Appendix C) or waterbody recovery plan between now and 2014. Specific criteria apply for delisting of impaired waterbodies in Section 2, and Appendixes G and I.

When a TMDL or waterbody recovery plan is developed, a public process is initiated. As part of the process, the public is notified of the document and can comment on it.

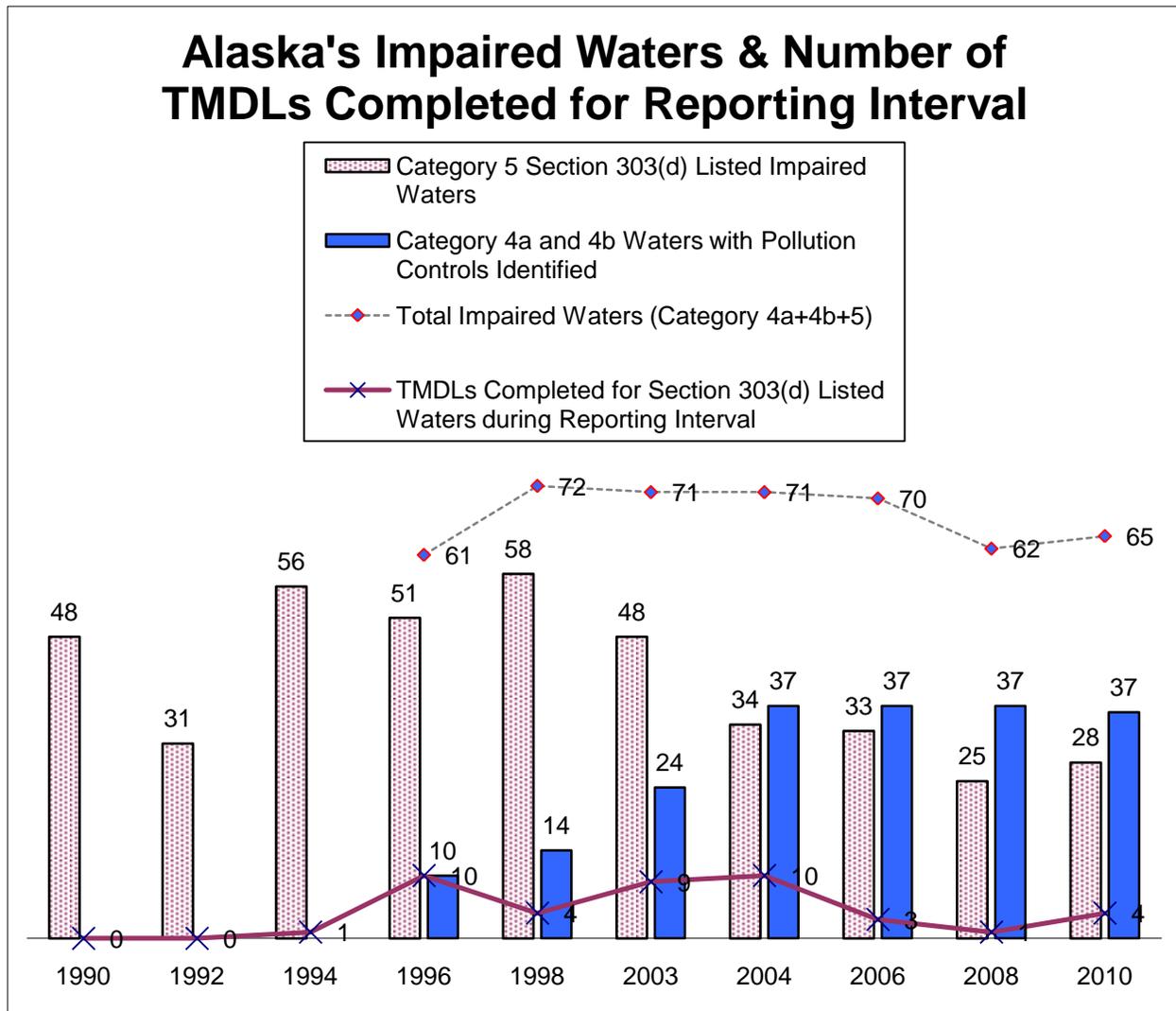


Figure 1 Alaska's Impaired Waters & Number of TMDLs Completed for Reporting Interval

## Significant Changes from Alaska's 2008 Integrated Water Quality Assessment Report

This 2010 Integrated Report documents the following water quality impairment changes from the 2008 Integrated Report:

- Addition of nine new impairments to the Section 303(d) list of impaired waters (Category 5):
  - Coffman Cove Creeks – consisting of five creeks, impaired from cadmium, copper, iron, manganese, nickel, and zinc.
  - Cottonwood Creek – 7 miles of the creek impaired from FC bacteria.
  - Kuskokwim River – 1000 feet of the river near confluence with Red Devil Creek impaired from antimony, arsenic, and mercury.
  - Red Devil Creek – 0.5 miles of the creek impaired from antimony, arsenic, and mercury.
  - Salt Chuck Bay – impaired from copper

1. Introduction—Purpose and Approach

- Five waters now attaining WQS:
  - Caribou Creek – The water is meeting the turbidity standard.
  - Iliuliuk Bay – The water is meeting the petroleum hydrocarbons standard.
  - Jewel Lake – The water is meeting the FC bacteria standard.
  - Kenai River – The water is meeting the petroleum hydrocarbons standard.
  - Nakwasina River – The water is meeting the turbidity and sediment standards.
- Four impaired waters now under a plan:
  - Jordan Creek – A TMDL has been developed for sediment and dissolved oxygen (DO).
  - Klag Bay – A TMDL has been developed for metals.
  - Noyes Slough – A TMDL has been developed for residues; the waterbody remains impaired from sediment and petroleum hydrocarbons.
  - Pullen Creek – A TMDL has been developed for metals.
- Six modifications of waters with impairments:
  - Cottonwood Creek – This water is no longer impaired from residues; however, 7 miles of the creek are being listed for FC bacteria.
  - Chena River – This water is no longer impaired from petroleum hydrocarbons; it remains listed for sediment.
  - Chena Slough – This water is no longer impaired from petroleum hydrocarbons; it remains listed for sediment
  - Dutch Harbor – Most of the water has been found to be meeting WQS, but areas of impairment still exist.
  - Hood/Spenard Lakes – This water is no longer impaired from FC bacteria; it remains impaired from low DO.
  - Ward Cove – This water is no longer impaired from sediment toxicity; it remains impaired for residues.

New listing and assessment methodology has been proposed for pathogens. No impairment determinations based on this new methodology were made in this 2010 report. The new listing and assessment methodology proposed for pathogens does not change the FC bacteria standard within Alaska's WQS (in 18 AAC 70); however, it does provide direction for implementing the standard when making water quality attainment or impairment determinations.

Other broader changes reflected in the 2010 report include the following:

- Six new waterbodies are reported in Category 3 because waters were added to the DEC water quality assessment database, which now identifies 303 Category 3 waterbodies.
- Narratives were updated based on existing and readily available information. Updates to Category 4a waterbody narratives were completed to describe development of TMDLs.
- ACWA waterbody priority rankings are included in Appendix H.
- Some descriptions of water quality management programs were updated in Appendix F.

**1. Introduction—Purpose and Approach**

## **Public Process Overview**

DEC has an open, ongoing solicitation for water quality data and information. To solicit ACWA waterbody nominations, DEC coordinates a continuous effort among state resource agencies. During the preparation and development of Alaska's 2010 Integrated Report, DEC actively solicited readily available and existing water quality data and information for use in preparing the report.

DEC posted a public notice solicitation for existing and readily available water quality data and information from August 3 to September 18, 2009. A 30-day public review and comment of the draft 2010 Integrated Report was provided from February 26, 2010, to March 30, 2010.

DEC considered public comments on the public notice draft of the report and made necessary changes to the final report. DEC prepared a responsiveness summary on the public comments received on the draft report and information received during the solicitation.

# 2 Description of Categories and Overview of Assessment Methodology and Results

This section of the Integrated Report describes the process used by the State of Alaska to evaluate the nature, health, and status of waterbodies. This evaluation process includes assigning waterbodies into five categories, depending on their health; determining which waterbodies need further action; scheduling when each polluted or impaired waterbody will be addressed; and involving the public in determining how waterbodies will be addressed. (Figure D-1, Logic Flow Diagram for Making Category Determinations, in Appendix D portrays the logic of assigning waterbodies to categories.)

Section 303(d) requires a list of impaired waterbodies that are not expected to meet standards without additional controls. Section 303(d) requires that for waterbodies found to be impaired or polluted, a TMDL must be conducted and implemented. Alternatively, a waterbody recovery plan can be developed and the water is placed in Category 4b. Many Section 303(d) listed waters have not undergone comprehensive water quality assessments to determine the extent of water quality impairment or whether existing controls are adequate to achieve the standards. DEC closely scrutinizes waterbodies to determine whether suspected water quality violations or persistent exceedances of WQS have been thoroughly investigated and documented. Careful review by DEC is intended to prevent the listing of waterbodies with inconclusive or circumstantial data or solely on the basis of observation.

## General Assessment Methods

DEC actively solicits all existing and readily available water quality data and information in accordance with EPA guidance. The information gathered is not limited to waters for which water quality problems have been reported by local, state, or federal agencies; members of the public; or academic institutions. Organizations and groups are contacted for research they may be conducting or reporting. University researchers, the U.S. Department of Agriculture, the National Oceanic and Atmospheric Administration (NOAA), the U.S. Geological Survey (USGS), and the U.S. Fish and Wildlife Service (USF&WS) are examples of such sources of field data.

DEC actively accepts and solicits water quality data and information on a continuous basis. Additionally, formal public notice that such information is sought is made every 2 years as part of developing the Integrated Report.

DEC considers and evaluates data and information from a wide range of sources, such as those listed below:

- Previous reports prepared to satisfy CWA Sections 305(b), 303(d), and 314 and any updates

## 2. Categories, Assessment Methodology, and Results

- Reports of ambient water quality data, including those prepared as part of state ambient water quality monitoring programs, complaint investigations, information generated by the public and other sources that provide readily available data (e.g., STORET, an EPA environmental database), and data and information provided in public comments
- Reports of dilution calculations or predictive models
- Water quality management plans
- Records of decision (RODs) for Superfund (contaminated) sites
- Safe Drinking Water Act (SDWA) source water assessments

In addition to these conventional sources of data, DEC also considers water quality data and information from citizen volunteer monitoring networks.

### General Considerations for All Waterbody Categories

The following subsections describe data quality and quantity considerations addressed by DEC when evaluating a water for inclusion on or removal from the Section 303(d) list of impaired waters (Category 5) or in making an attainment determination.

#### Data Quality Considerations

DEC considers whether typical elements of a quality assurance project plan (QAPP) are submitted for water quality data and information. A QAPP checklist for sampling, a QAPP review checklist, and a description of elements that characterize a good QAPP are available on the DEC's web site at [http://www.dec.state.ak.us/water/wqapp/wqapp\\_index.htm](http://www.dec.state.ak.us/water/wqapp/wqapp_index.htm).

Water quality data and information that is collected and submitted without a QAPP or that uses a QAPP for which the level of confidence is weak will not be relied on to make an impairment determination. Such data and information may only be considered as ancillary information to support an attainment or impairment determination.

#### Data Quantity Considerations

Adequate data quantity is necessary to make well-grounded attainment and impairment decisions. Assessments based on larger sample sets are preferred because they are more likely to yield accurate conclusions than assessments based on smaller sample sets.

Enough data or information should be available to indicate that standards are or are not exceeded, or that uses are or are not impaired, and that such measurements are representative of the waterbody.

2. Categories, Assessment Methodology, and Results

## Categories and Assessments

### Category 1 – WQS Attained for All Uses

Waterbodies are placed in this category if data are available to support a determination that all WQS are attained.

#### Criteria Used to Classify a Waterbody as Category 1

The majority of Alaska's waters are not subject to man-caused stressors and are considered unimpaired. DEC expects that 99.9% of Alaska's waters can be classified as Category 1; however, no specific waters are identified in this category.

### Category 2 – WQS Attained for Designated Uses

Waterbodies are placed in this category if some of the WQS for the designated uses are attained.

Waterbodies are placed in Category 2 if data and information are available to support a determination that some, but not all, uses are attained and if the attainment status for the remaining uses is unknown because there is insufficient or no data or information. These waters are presumed to be attaining all uses. Monitoring should be scheduled for these waters to determine whether the uses previously found to be in attainment remain in attainment and to determine the attainment status of those uses for which data and information were previously insufficient to make a determination. The 44 waterbodies assigned to Category 2 are identified in Appendix A.

#### Criteria Used to Classify a Waterbody as Category 2

Waterbodies that have been previously identified as impaired but are now attaining a water quality standard are placed in this category. Examples are waters for which a TMDL or other pollution controls have been implemented or for which recent monitoring data support a determination that the water quality standard is attained.

Waterbodies associated with residue discharges are also placed in Category 2 if recent dive survey reports show that WQS are attained and have continued to be attained.

Waterbodies that were determined to be impaired from residues and listed as Category 5 but have a documented continuous coverage of residues of less than 1.0 acre are also placed in Category 2 and are identified in Appendix A.

### Category 3 – Data or Information Insufficient

Waterbodies are placed in Category 3 if data or information are insufficient to determine whether the WQS are attained for any of the designated uses.

An additional seven waterbodies have been identified for placement in Category 3 since the 2008 Integrated Report. The 304 Category 3 waterbodies are identified in Appendix A.

## **2. Categories, Assessment Methodology, and Results**

### **Criteria Used to Classify Waterbodies as Category 3**

Alaska's water resources include more than 3 million lakes larger than 5 acres in size, 714,004 miles of rivers and streams, more than 175 million acres of fresh water wetlands, and 44,000 miles of coastal shoreline. Because of the size of its water resources, Alaska has insufficient, inadequate, or little to no data or information to support attainment or impairment determinations for many waterbodies. DEC expects that the majority of these waters would be assigned to Category 1—waters attaining standards for all uses—if it had information available to assess them.

Category 3 includes waters DEC formerly called “open files” and waters nominated for assessment through the ACWA process of Alaska's three resource agencies: DEC, Alaska Department of Fish and Game (ADF&G), and Alaska Department of Natural Resources (DNR). Actions that trigger opening a file can include nomination from the public, a public complaint, a newspaper report, or more rigorous information such as water quality reports or assessments. For many of these waters, definitive water quality data or information to determine whether water uses are being attained or impaired is lacking, scant, spotty, or outdated. Many of these waters have been brought to the attention of Alaska's state resource agencies for suspected pollution or for impairment of water quantity or fish habitat. DEC maintains files on some of these waterbodies, and the information is available upon request.

Some circumstances under which a water may be assigned to Category 3 are identified below:

- The data and information were collected using unacceptable quality assurance/quality controls and could not be used to provide an accurate assessment.
- The quantity of the existing and readily available data and information is inadequate to provide an accurate assessment.
- The existing and readily available data and information are not representative of current conditions of the waterbody. Examples of conditions that might have altered current conditions are (1) significant land use changes occurred in the watershed affecting the hydrology and nonpoint loadings, (2) point source discharges were removed or new discharges are now operating, (3) Alaska made significant changes in applicable data collection methodologies, or (4) sampling station locations did not reflect the character of the waterbody segment.

### ***The ACWA Process***

Through the ACWA process, DEC, DNR, and ADF&G work together to focus state and federal resources on addressing issues of water quality, water quantity, and aquatic habitat for the waters with the greatest need. These cooperating agencies have developed a waterbody nomination and ranking process that relies on established criteria to identify priorities for assessment, stewardship, and corrective action needs. The process addresses waters affected by these and other problems: presence or risk of pollution, habitat degradation, and quantity problems. Several components of ACWA are interwoven and occur concurrently.

## 2. Categories, Assessment Methodology, and Results

### **Determination About Future Actions**

The entire ACWA process (consisting of the integrated components) is conducted in three phases: nomination, analysis, and action. During the nomination phase, each waterbody nominated by the public, agencies, or both is reviewed. Information identifying the waterbody is entered into the ACWA database. The nominator may be asked for additional information.

The ACWA database uses four tracks to identify the nominated waterbodies: Data Collection and Monitoring, Adequately Protected Waterbodies, Waterbody Recovery, and Protect and Maintain Waterbodies at Risk. Identification of the applicable track is an ongoing process and is affected by evaluations, analysis, and ranking, as well as receipt of additional data and information. Therefore, new knowledge or decisions may lead to placement of the waterbody in a different track. For example, during the analysis and action phases, the identification of additional data needs may result in the waterbody being reassigned to the Data Collection and Monitoring track.

Waterbodies for which data are not sufficient to suggest a current or anticipated problem are placed in the Data Collection and Monitoring track. The waterbodies for which sufficient and credible data are available and for which those data suggest existence of a current water quality, water quantity, or aquatic habitat problem or the likelihood of future problems are subject to additional evaluation. Those further evaluations assess the effectiveness of agency stewardship and determine the persistence of standard exceedances or of regulation violations. Many of these waterbodies are entered in the Protect and Maintain Waterbodies at Risk or Waterbody Recovery database tracks.

The determination about future actions primarily considers whether the water is at risk, in need of recovery, or adequately protected. The determination is used by the agencies to identify actions needed for a particular water.

Waterbodies that are at risk and waterbodies needing recovery are addressed as follows during the action phase:

- Priorities for action on individual waterbodies are established.
- Protection or recovery actions are identified and implemented.
- The success of protection/recovery actions and directing the waterbody for additional information, continued monitoring, or additional protection/recovery actions is evaluated.

Finally, waterbodies that are determined to be adequately protected are placed in the Adequately Protected waterbodies track.

### **Analysis of Data**

During the analysis phase, a successfully nominated waterbody undergoes a series of determinations using established criteria to assess the adequacy and credibility of the associated data available for the waterbody. This step is called a “sufficient and credible data review.” Tables used to assist in reviewing the rigor of the data and information associated with each water and to score each water are available at <http://www.dec.state.ak.us/water/acwa/pdfs/su.pdf>.

## **2. Categories, Assessment Methodology, and Results**

In scoring waters for sufficient and credible data, three topics are considered: Data Content, Data Coverage, and Data Quality. Parameters addressed under Data Content evaluate how sufficiently and completely the information contained in the nomination describes the nature and extent of the identified issue. Parameters addressed under Data Coverage and Data Quality evaluate the quality of the information provided and how rigorous it is.

Data Content scoring considers the basis for the assessment of use attainment, the land use information available for the water, information on the expected reference condition, information on the source or sources of pollution, and the availability of photographs showing the condition of the water. The objective is to identify whether the available data are sufficient to identify the existence or extent of a current or potential problem.

Data Coverage scoring considers the number of locations and seasonal information available. Data Quality scoring considers adequacy of the quality assurance and quality control for the information, whether sampling protocols were documented, and how relevant and current the information is.

Nearly all of the Category 3 waters identified in this Integrated Report have gone through the sufficient and credible data step in the ACWA process. A small number of waters at any given time are placed in a “pending” status until the water quality information and data associated with the water undergo a sufficient and credible data review step.

### ***Creation of the ACWA Priority Ranking***

In addition to the analysis of data and overall determination of future actions for the watershed, the waterbodies are ranked to establish priorities. The waterbody ranking enables agencies to focus resources on the most important priorities. Criteria were developed to assign a numeric value that identifies relative priority to each successfully nominated waterbody, resulting in the ACWA Priority Ranking.

Six factors are used to score each of three components: water quantity, water quality, and aquatic habitat. The six factors are as follows:

- Allocation, or the extent to which the water has been obligated for various uses
- Condition
- Protection
- Future use
- Present use
- Value

Evaluation for each of the six factors results in relevant scoring for each component. The possible scores are high (5), medium (3), or lower (1).

Staff from one of the three resource agencies review readily available information and data related to a given waterbody and use their best professional judgment to assign a factor rating. The agency with statutory or regulatory authority over the water resource component is responsible for assessing that component. The following considerations guide the ranking decisions: (1) the statutory criteria, (2) severity of pollution, and (3) expected uses of the waters, according to CWA Section 303(d)(1)(A).

## 2. Categories, Assessment Methodology, and Results

The DNR hydrologists provide factor ratings for water quantity; biologists in the ADF&G provide aquatic habitat factor ratings; and DEC provides water quality ratings. Appendix H provides ranking for each waterbody. More detailed information on the ranking process is available online at [http://www.dec.state.ak.us/water/acwa/acwa\\_ranking.htm](http://www.dec.state.ak.us/water/acwa/acwa_ranking.htm).

### ***Distinctions for the ACWA Process and Listing of Waters by Category***

For the ACWA process and the categorization or listing of waters in the Integrated Report, two important points should be noted:

- The process for the Integrated Report listing decisions is different from the process used for ACWA ranking and priorities. An impairment listing is considered in the ACWA process, and most waters that are listed as impaired under Categories 5 and 4 are ranked as high priority by the ACWA process. In other words, the Integrated Report plays a role in the ACWA prioritization process. ACWA does not drive the listing decision; it provides information management and helps with identifying and implementing actions that will remove impairments.
- One component of the ACWA process is an analysis of whether sufficient and credible information exists. This analysis is only used for ACWA prioritization for further action; it does not determine whether data are sufficient for a use in an attainment decision. The criteria used for attainment and listing decisions are discussed under the "Criteria Used to Classify a Waterbody as Category 5" section of this report.

### **Category 4 – Impaired Waterbody**

Category 4 waters have been determined to be impaired but do not need a TMDL. The three subcategories of Category 4 waters are discussed below.

#### **Category 4a – TMDL Has Been Completed**

An impaired water that was previously listed in Category 5 but for which a TMDL has been completed and approved by EPA is assigned to this category.

For waterbodies that have been placed in this category, a TMDL addressing a specific impairment has been developed and approved by EPA. It is expected that implementation of that TMDL will result in full attainment of the WQS applicable for that specific impairment. If the waterbody has another impairment, the waterbody will also be assigned to Category 5 until a TMDL has been developed and approved for that impairment.

Monitoring should be scheduled for Category 4a waters to verify that the WQS have been met after implementation of the water quality management actions needed to achieve one or more TMDLs.

33 TMDLs have been developed for 32 waterbodies and are identified for placement in Category 4a are described in Appendix A.

#### ***Criteria Used to Classify a Waterbody as Category 4a***

The key criterion for Category 4a is a completed and approved TMDL.

## 2. Categories, Assessment Methodology, and Results

### **Category 4b – Other Pollution Control Requirements Are Reasonably Expected to Result in Attainment of the Water Quality Standard in a Reasonable Period of Time**

Waters are placed in this category when other pollution control requirements required by a local, state, or federal authority are stringent enough to achieve any WQS applicable to such waters. These pollution control requirements should specifically apply to the particular water quality problem.

Monitoring should be scheduled for these waters to verify that the WQS will be attained as expected.

The four waterbodies identified for placement in Category 4b are shown in Appendix A.

#### ***Criteria Used to Classify a Waterbody as Category 4b***

For waterbodies placed in Category 4b, controls and assurances are sufficiently stringent that the waterbody is expected to meet standards in a reasonable time period. The following are examples of pollution controls:

- An approved state or federal ROD associated with a state or federally approved cleanup action for a contaminated site
- An approved remediation plan for a permitted facility, such as a log transfer facility (LTF), reporting more than 1.5 acres of continuous residue coverage
- A National Pollutant Discharge Elimination System (NPDES) permit that incorporates TMDL-type controls for the permitted facility
- A water-quality based permit with controls or assurances that water quality goals will be met
- Restoration, remediation, or recovery measures or plans with controls and assurances that are sufficiently stringent to assure that water quality goals will be attained within a reasonable time period

Key factors that must be considered before placing a waterbody in Category 4b are as follows:

- The need for pollution controls or measures
- Whether requirements and controls are sufficiently stringent that standards can be expected to be met in a reasonable time period
- Assurances that the requirements and controls will be implemented in a reasonable time period

Placing a water in Category 4b requires EPA approval and the development of a Category 4b rationale that must address the following six elements:

1. Identification of impaired segment and statement of problem causing the impairment
2. Description of pollution controls and how they will achieve WQS
3. An estimate or projection of the time when WQS will be met
4. Schedule for implementing pollution controls
5. Monitoring plan to track effectiveness of pollution controls

## 2. Categories, Assessment Methodology, and Results

### 6. Commitment to revise pollution controls as necessary

Determining whether to place a waterbody in Category 4b requires the application of best professional judgment and agency enforcement discretion. This approach includes discussion and analysis of a variety of factors such as pollutant characteristics (for instance, consideration of the magnitude, frequency, and duration of the pollution event or events), pollutant sources, size of the waterbody, the stringency of the requirements or assurances, and the degree of recovery response required.

Waterbodies associated with residue discharges also are placed in Category 4b if the following conditions are met: (1) two or more dive survey reports from LTFs document more than 1.5 acres of continuous residues coverage and (2) the waterbody is addressed in an approved remediation plan under the LTF General Permit (GP) or under an individual state wastewater discharge permit. (Information on remediation plans is provided in Appendix G.) Waterbodies that are under EPA compliance orders for seafood residue violations may also be considered for placement in Category 4b if compliance with the order ensures that the water will attain the water quality standard for the residues in a reasonable time period.

### **Category 4c – Impairment Is Not Caused By a Pollutant**

Waterbodies are placed in this category if the impairment is not caused by a pollutant affecting water quality. An example of an impairment with a cause other than water quality is degraded riparian habitat.

Category 4c waterbodies should be considered for monitoring to confirm no pollutant-caused impairment is present and to support water quality management actions necessary to address the cause or causes of the impairment.

No Category 4c waterbodies are currently identified; however, Alaska's resource agencies use this category to track waterbodies with non-pollutant impairments.

### **Criteria Used to Classify a Waterbody as Category 4c**

Alaska has not adopted specific criteria or standards to identify any impairments not related to water quality. ACWA priority rankings identify aquatic habitat or water quantity waters for action, but these waters are not referred to as "impaired" because they are not impaired in terms of water quality.

### **Category 5 – Impaired Waterbodies on the Section 303(d) List**

Waterbodies are placed in Category 5 if one or more WQS (in 18 AAC 70) are not attained. Waters are also placed in Category 5 if the waterbody is impaired for at least one designated use and a TMDL or waterbody recovery plan to attain applicable WQS is required.

The 28 waterbodies identified for placement in Category 5 and on the Section 303(d) list are described in Appendix A.

## 2. Categories, Assessment Methodology, and Results

### Criteria Used to Classify a Waterbody as Category 5

The Alaska listing methodology for determining impairments from turbidity, pathogens, and residues is described in Appendix I.

Waterbodies in Category 5 constitute the CWA Section 303(d) list of waters impaired by one or more pollutants and for which applicable TMDLs are needed. A waterbody is listed in this category if application of Alaska's assessment and listing methodology finds that a pollutant has caused impairment. According to CWA Section 303(d) and EPA's implementing regulations, Section 303(d)-designated waters include impaired surface waters that do not or are not anticipated to meet applicable WQS solely through the implementation of existing technology-based or similar controls. In Alaska, these waterbodies are priority-ranked based on the severity of the pollution, the feasibility of implementing a waterbody recovery plan, and other factors. The development of a TMDL or equivalent waterbody recovery plan for these waterbodies is scheduled 8 to 13 years into the future from the time they are first placed on the Section 303(d) list.

Impaired waterbodies are surface waters with documentation of actual or imminent persistent exceedances of water quality criteria, adverse impacts to designated uses, or both, as defined in Alaska WQS. Designation of a waterbody as impaired does not necessarily indicate that the entire waterbody is affected. In most cases, only a segment of the waterbody is affected. When possible, the assessment process identifies the specific segment that is impaired and the corresponding pollutant parameters of concern.

The term "persistent" is key to determining whether a surface waterbody is impaired. Determining persistent exceedances of WQS is a waterbody-specific decision that requires the application of best professional judgment. This approach includes discussion and analysis of a variety of factors such as pollutant characteristics (for instance, consideration of the magnitude, frequency, and duration of the pollution event or events); pollutant sources; size of the waterbody; and the degree of remediation response required.

DEC makes impairment determinations based on credible data. The term "credible data" means scientifically valid chemical, physical, or biological monitoring data collected under a scientifically accepted sampling and analysis plan, including quality control and quality assurance procedures that are consistent with Alaska WQS (18 AAC 70). Water quality data supportive of an impairment determination must be specific to the waterbody. Water quality data and information that are less than 5 years old are preferred. In certain instances, data and information more than 5 years old may be considered in an impairment determination. For those instances, the data and information are carefully scrutinized and reviewed before they are validated as credible.

Impairment determinations must be substantiated with empirical water quality chemistry unless the water quality criterion is a narrative qualitative standard such as the absence of a visible sheen or presence of sludge.

DEC uses the following guidelines to determine whether a waterbody is impaired:

- Water quality monitoring data that documents persistent exceedances of a criterion or criteria established in Alaska WQS (18 AAC 70)

## 2. Categories, Assessment Methodology, and Results

- Issuance of a notice of violation or other enforcement action definitively linked to a persistent water quality violation (of 18 AAC 70) that does not result in adequate corrective measures
- Photographs or videos with appropriate documentation definitively linked to persistent exceedances of WQS (Photographic or videographic documentation is supportive of water quality data unless such documentation is supportive of a narrative water quality criterion such as for residues.)
- Documented persistent presence of residues (floating solids, debris, sludge, deposits, foam, scum) on or in the water, on the bottom, or on adjoining shorelines
- Documentation or water quality data, such as a report or study within the last 5 years, that demonstrates designated uses are adversely affected by pollutant condition data or documentation that is more than 5 years old. Data or documentation older than 5 years old is only considered if it is determined to reflect the current condition of the waterbody.
- Developed listing methodology guidelines
- Documentation from a resource agency or other credible source that applies the use of best professional judgment to provide credible data. Best professional judgment is used to determine whether a waterbody persistently exceeds WQS or has designated uses that are adversely affected by pollutant sources.

Best professional judgment determinations should be made by more than one professional and at the agency level; must be made by a professional knowledgeable in the relevant field of expertise and generally be based on that person's experience and all the information reasonably available at the time; should be based on the best available scientific data and information; and must be subject to management level review.

Best professional judgment recommendations from outside DEC must be affirmed by DEC, and available data and basis for the decision should be documented.

Alaska's process for listing an individual waterbody under Section 303(d) begins with an internal review of existing and new information for ACWA-nominated waters or former open files. Waters may be brought to the attention of DEC by its staff, other state and federal agencies, municipalities, Native organizations and tribes, industry, and the concerned public. In the development of the Integrated Report, DEC solicits public participation in providing existing and readily available water quality data and information.

DEC staff initially evaluate available information about a waterbody to determine the presence of pollutants and/or persistent exceedances of WQS or impacts to the designated uses and the degree to which WQS are attained. This process constitutes a DEC desk audit and may involve a preliminary field review and the collection of water quality monitoring data. The possible findings and the subsequent actions are described below:

- Credible data and information indicates that the waterbody may be impaired and that existing controls may be inadequate to attain or maintain standards in a reasonable time period. The

## **2. Categories, Assessment Methodology, and Results**

waterbody is placed on the Category 5 list. As needed, these Section 303(d) listed waterbodies are scheduled for comprehensive water quality assessments.

- Credible data and information indicates that the waterbody may be impaired and that existing controls are adequate to attain or maintain standards in a reasonable time period. If a water undergoes the process associated with a Category 4b assignment and meets those requirements, the waterbody may be placed in Category 4b. Category 4b waters are tracked and monitored until standards are achieved.
- Credible data and information on a waterbody indicates the waterbody is not impaired. The waterbody is placed in Category 1 or 2. Category 1 and 2 waters typically require no further action but may be reconsidered at any time if new water quality data or information becomes available.

Not all Section 303(d)-designated waters have undergone comprehensive water quality assessments to determine either the extent of water quality impairment or whether existing controls are adequate to achieve the standards. DEC closely scrutinizes waterbodies to determine whether suspected water quality violations were thoroughly investigated and documented. This approach is designed to prevent the listing of waterbodies with inconclusive or circumstantial data or solely on observations.

A completed water quality assessment of a Category 5 waterbody confirms the extent of impairment to water quality, designated uses, or both. A comprehensive assessment requires the identification of the pollution source and pollutant causing the impairment. The subsequent actions that follow specific findings of the assessment are described below:

- The assessment indicates the waterbody is impaired and that existing controls are inadequate to achieve WQS in a reasonable time period. Category 5 waterbodies require a TMDL or equivalent waterbody recovery plan.
- The assessment indicates the waterbody is impaired but confirms existing controls are adequate to achieve standards in a reasonable time period. The waterbody is placed on the Category 4b list.
- The assessment indicates that the waterbody is not impaired. The waterbody is placed in Category 1 or 2.

Section 303(d) listed waterbodies are scheduled for TMDL development or waterbody recovery plan, now and out to year 2014. The TMDL schedule and the criteria for developing the schedule are provided in Appendix C.

DEC has developed specific listing criteria guidelines for the most common pollutants for impairments from turbidity, pathogens, and residues in Appendix I. Additional listing criteria guidelines for residues is contained in Appendix G. Site specific information including biological assessment information (such as sediment profiling imaging) can be used to help determine whether an impairment exists and may be used to justify variance from listing methodologies as long as the information provides a clear demonstration as to whether the waterbody is meeting the applicable water quality standard.

## 2. Categories, Assessment Methodology, and Results

### Removal of Waterbodies from the Category 5 List

After a waterbody has been placed on the Category 5 list, several conditions can lead to removal of the waterbody from the list. All determinations to remove waterbodies from the Category 5 list are subject to approval by EPA. One or more of the following conditions can support delisting of a waterbody:

- More recent and accurate data show that one or more of the applicable WQS are met.
- More sophisticated water quality modeling demonstrates that one or more of the applicable WQS are met.
- Flaws in the original analysis of data and information led to the water being incorrectly listed.
- Revised listing criteria negate the criteria for listing.
- The water quality standard for which the waterbody was listed has been revised and the water meets the new water quality standard.
- Sufficiently stringent requirements have been applied. Examples are incorporation of TMDL-type controls into the NPDES permit or controls such as those applied by a cleanup or remediation plan with assurance that one or more of the WQS will be met within a reasonable time period.
- A TMDL or equivalent waterbody plan has been developed. If a TMDL is developed, the water is placed in Category 4a; if an equivalent waterbody recovery plan is developed, the water is placed in Category 4b.
- Other pollution controls that ensure WQS are attained and are developed in a reasonable time period (as described for Category 4b waterbodies).
- Other relevant information supports the decision that the water should not be included on the Category 5 list.

In addition, all of the following conditions are required to support a determination to remove a water from the Category 5 list:

- “Good cause”—an explanation of why or on what basis the water was originally listed and why it is now appropriate to remove the listed water or redefine the listed area—has been demonstrated.
- An administrative record and documentation supporting the recommended determination is needed.
- A public notice of the proposed delisting is published and public comment is sought. Typically the Integrated Report acts as the vehicle for providing public notice and soliciting comments. In special instances, a public meeting could be held in the community closest to the waterbody in question.
- When considering a determination to remove a waterbody from the Category 5 list, the level of data to support a determination and burden of proof are not required to be greater than were used in the initial listing determination.

# APPENDIX A Waterbody Categories 2 through 5

The tables in this appendix describe the waterbodies that have been placed in Categories 2 through 5. No waterbodies in Alaska have been identified as Category 1 because the state does not possess that level of information for any one waterbody.

To more easily sort and find waterbodies within the tables of this appendix, each waterbody is associated with one of three general regions in Alaska. Within each category, waterbodies are organized by region in the following order: Interior, Southcentral, and Southeast.

Unless otherwise stated in the narrative associated with a waterbody, no determination has been made about the effects to any designated use(s) for that waterbody.

The following abbreviations or notations are used consistently in Appendix A tables:

- The “Region” column indicates the general region of Alaska in which the waterbody is located. The abbreviations are defined as follows: IN for Interior, SC for Southcentral, and SE for Southeast.
- The “AK ID Number” column identifies the Alaska waterbody-specific identification number, such as “20402-409.” The first five digits of the number represent the USGS hydrologic (catalog) unit in which the waterbody is located. The last three digits identify the type of waterbody, as follows: 001 for rivers, creeks, or streams; 400 for lakes; 500 for bays (i.e., marine waters); 600 for estuaries; 700 for wetlands; and 800 for coastal waters (i.e., coastline).
- The “Waterbody” column provides the name of the waterbody.
- The “Location” column describes the area or provides location information to clarify the location of the waterbody.
- The “Area of Concern” column describes the specific area of the waterbody that is considered. The abbreviation “N/A” means either “not applicable” or “not available.”
- The “Water Quality Standard” column identifies the 18 AAC 70 standard that is being measured. This column also identifies one or more WQS that are not attained in the waterbody if the water is a CWA Section 303(d) listed (Category 5) waterbody.
- The “Pollutant Parameters” column identifies the specific pollutant or pollutants for which the waterbody is impaired or, for non-impaired waterbodies, the specific pollutant or pollutants of concern. For instance, a waterbody could be Section 303(d) listed as impaired for the “Residues” standard from the specific pollutant parameter of bark and woody debris.
- The “Pollutant Sources” column identifies the source or sources of the pollutant or pollutants.

## Category 2 Waterbodies

### Alaska's 2010

#### Integrated Water Quality Monitoring and Assessment Report

**Category 2 Waterbodies** – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
<b>IN</b>	<b>Category 2</b>	<b>40510-005</b>	<b>Caribou Creek</b>	<b>Denali National Park</b>	<b>16.1 miles</b>	<b>Turbidity</b>	<b>Turbidity</b>	<b>Mining</b>
<p>Caribou Creek was included on the 1994 Section 303(d) list for turbidity from past mining activity within Denali National Park and Preserve. The waterbody lost its sinuosity along segments of the watershed. Currently there is no active mining on Caribou Creek and current National Park Service (NPS) policy will not permit future placer mining. A site visit with NPS, EPA, and DEC was conducted in 2009 to review the progress of previous reclamation efforts and to assess any areas requiring additional reclamation activities. NPS established seven cross sections for floodplain design purposes. Topographic monitoring was conducted before and after the establishment of the seven cross sections. Channel locations and sinuosity were surveyed with a global positioning system (GPS), and water discharge was measured. Analysis and evaluation of site and data concluded that Caribou creek is meeting the turbidity standard, although further work would be beneficial. Therefore, a draft recovery plan has been prepared to reconstruct the floodplain, rebuild the channel(s), and provide for more natural overbank flooding and deposition. The reconstruction will be followed by a revegetation effort. If funding becomes available, work is to begin in 2010.</p>								
<b>IN</b>	<b>Category 2</b>	<b>40506-007</b>	<b>Chena River</b>	<b>Fairbanks</b>	<b>15 miles</b>	<b>Petroleum Hydrocarbons, Oils &amp; Grease</b>	<b>Petroleum Products</b>	<b>Urban Runoff</b>
<p>Chena River was Section 303(d) listed in 1990 for turbidity; petroleum hydrocarbons, oils and grease; and sediment. The identified pollutant source is urban runoff. DEC conducted sampling in 2005, 2007, and 2009 for hydrocarbons and sediment. Data have shown that the Chena River met WQS for the petroleum hydrocarbon standard and remains impaired from sediment. Data are currently being reviewed for the sediment standard.</p>								
<b>IN</b>	<b>Category 2</b>	<b>40506-002</b>	<b>Chena Slough</b>	<b>Fairbanks</b>	<b>13 miles</b>	<b>Petroleum Hydrocarbons, Oils &amp; Grease</b>	<b>Petroleum Products</b>	<b>Urban Runoff</b>
<p>This waterbody was Section 303(d) listed in 1994 for non-attainment of the petroleum hydrocarbons, oils and grease standard and the sediment standard. Information presented in the 1994 Statewide Water Quality Assessment survey indicated that a petroleum problem existed and was affecting water quality. File assessment information indicates nonpoint source problems result from the surface water runoff, road construction, site clearing, and dewatering activities from gravel operations. Based on best professional judgment of DEC staff, this water was listed for petroleum products. DEC conducted water quality testing in 2005, 2007, and 2009. Data have shown that the Chena Slough met WQS for the petroleum hydrocarbon standard. Data are currently being reviewed for the sediment standard.</p>								

## Category 2 Waterbodies

### Alaska's 2010

#### Integrated Water Quality Monitoring and Assessment Report

**Category 2 Waterbodies** – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
<b>IN</b>	<b>Category 2</b>	<b>40505-401</b>	<b>Harding Lake</b>	<b>Fairbanks</b>	<b>N/A</b>	<b>Fecal Coliform Bacteria</b>	<b>Fecal Coliform Bacteria</b>	<b>Urban Runoff</b>
<p>Harding Lake was placed on the 1998 Section 303(d) list and was delisted on February 13, 2004. Harding Lake first appeared on the Alaska Section 303(d) list in 1994. In compiling the 1994 list, data were reviewed from studies conducted in 1974, 1986, 1987, 1988, and 1994. Virtually all data showed Harding Lake was consistently meeting the FC bacteria WQS during each sampling effort. However, one sample collected in 1986 showed a high level of FC bacteria (more than 60 colonies/100 milliliters [ml]). Although the geometric mean of 29 samples taken during the 1986 study was meeting WQS (15.7 colonies/100 ml), a graduate student study of Harding Lake suggested the lake may not be meeting the standard because of extensive recreational use. Because of this concern, DEC decided that “based on the limited sample results and high population density using onsite wastewater disposal systems, it is likely that additional monitoring will show the waterbody to be water quality limited for fecal coliform bacteria.” Harding Lake continued to be listed in 1996 and 1998 listings because no more information was available. DEC conducted additional monitoring and data analysis in 1999. Data collected in fiscal years 1999, 2000, and 2001 through an approved QAPP showed 83% non-detects and no exceedances of Alaska WQS (18 AAC 70) for FC bacteria of less than 20 FC/100 ml. These results were consistent with samples collected in 1987, 1988, and 1994 that also showed Harding Lake attaining WQS. A sampling report prepared by the DNR Division of Land, Mining and Water (DOLMW) and DEC and previous studies by DEC documents this information. In summary, the initial listing relied on one sample event and a concern that increased recreational use of the lake was causing suspected additional FC bacteria inputs to the lake. In reviewing the initial listing, it is clear that the one high sample result was an inconsistent outlier and should not have led to listing Harding Lake as impaired. Later sampling showed WQS are being achieved and the recreational use of the lake is not causing violations as initially suspected. The new level of information showing Harding Lake should be delisted is a much stronger body of evidence than that used for the original listing determination. Based on the findings, Harding Lake was removed from Alaska’s Section 303(d) list of impaired waters in the 2002/2003 Report.</p>								

## Category 2 Waterbodies

### Alaska's 2010

#### Integrated Water Quality Monitoring and Assessment Report

**Category 2 Waterbodies** – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
IN	Category 2	60402-601	Nearshore Beaufort Lagoons	Sag River to Simpson Lagoon	N/A	Temperature, Dissolved Inorganic Substances	Temperature, Salinity	Causeway
Nearshore Beaufort Lagoons was placed on the 1996 Section 303(d) list for temperature and salinity. In 1998 the waterbody was delisted and moved to Category 4b for tracking and monitoring. Various study reports and information from the EPA Alaska Operations Office indicated that the hydrology and water quality (temperature and salinity) of the Nearshore Beaufort Sea was affected by the causeways and was suspected to have adverse effects to anadromous fish in 1996. Mitigation to correct problems with water quality and fish passage agreed upon in the Negotiated Settlement Agreement for Endicott and West Dock Causeways between the U.S. Army Corps of Engineers (USACE) and the permit holders (Public Notice 91-1). This mitigation, described more specifically in permit modification FF 820562, consisted of additional breaching at both West Dock and Endicott causeways. Breaching construction was finished in fall 1995. The North Slope Borough requires water quality monitoring of the waterbody as a condition to conduct oil and gas operations adjacent and within the waterbody. Monitoring for temperature and salinity of Nearshore Beaufort Lagoons is performed on an annual basis during the ice-free periods, as required by the North Slope Borough. Data and information transmitted to DEC and EPA in 2002 support that this waterbody is attaining the WQS for temperature and dissolved inorganic substances. Post-causeway monitoring studies have demonstrated that there is no biological impact and that water quality is within state standards. Based on this information, the waterbody was placed in Category 2 in 2003.								
SC	Category 2	30102-605	Captain's Bay	Unalaska Island	N/A	Residues	Settleable Solids	Seafood Processing
This waterbody was placed on the 1994 Section 303(d) list for settleable solids. Data used for the 1994 list indicated that the established zone of deposit (ZOD) for the discharger was being exceeded. Monitoring data evaluated by the DEC has resulted in the conclusion that the discharger is meeting ZOD requirements. This waterbody was removed from the Section 303(d) list in 1998.								
SC	Category 2	20401-403	Cheney Lake	Anchorage	N/A	Fecal Coliform Bacteria	Fecal Coliform Bacteria	Urban Runoff, Storm Drainage
Cheney Lake was placed on the 1994 Section 303(d) list for non-attainment of the FC bacteria standard. Water quality data collected by the Municipality of Anchorage from 1991 to 1994 indicated that the FC bacteria criterion was exceeded in almost every month of monitoring. However, in 2006 DEC conducted extensive water quality monitoring in Cheney Lake. The 2006 data shows FC bacteria levels met state WQS the vast majority of the time. DEC believes the higher levels, when state WQS were exceeded, are from natural conditions. Cheney Lake is currently meeting WQS for two reasons: (1) the Municipality of Anchorage (and USF&WS) campaign to reduce the goose populations in Anchorage (because of increased number of geese/aircraft incidences, including a crash of a military plane with numerous fatalities blamed on waterfowl), and (2) a successful public awareness campaign educating pet owners on the benefits and owner responsibility of picking up after pets, i.e., "Scoop the Poop" campaign. As a result of this monitoring, Cheney Lake was removed from the Section 303(d) list and placed in Category 2 in 2008.								

A. Waterbody Categories 2 through 5

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<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
SC	Category 2	20505-001	Cottonwood Creek	Wasilla	Entire 13 miles	Residues	Foam & Debris	Urban Runoff, Urban Development
<p>Cottonwood Creek (13 miles) was Section 303(d) listed for non-attainment of the residues standard for foam and debris in 2002/2003. DEC received numerous complaints about foam in Cottonwood Creek and foam was observed in the creek in 1998, 2000, 2001, and 2002. The problem was recurring, with no existing controls to address it. An intensive water quality evaluation was conducted on Cottonwood Creek, commencing in September 2004. Water quality sampling conducted in 2004 and 2005 indicated that the foam present in Cottonwood Creek is most likely naturally occurring. However, hydrologic changes within the watershed may be influencing the amount and timing of the foam. The foam was further investigated, and water sampling conducted in 2006 examined temperature and FC bacteria. Foam was determined to be naturally occurring and to be meeting WQS. Foam was determined to be influenced by natural conditions. Fecal coliform bacteria were found to exceed WQS, and the source(s) was unknown, and section of Cottonwood Creek has been determined to be impaired from FC bacteria.</p>								
SC	Category 2	30401-601	Dutch Harbor	Unalaska Island	0.5 acre	Petroleum Hydrocarbons, Oils & Grease	Petroleum Products	Industrial, Urban Runoff
<p>Dutch Harbor was Section 303(d) listed in 1994 for non-attainment of the petroleum hydrocarbons, oils and grease standard for petroleum products. An EPA study in August 1994, <i>Water Quality Assessment for Greater Unalaska Bay</i>, concluded the waterbody was affected by petroleum products. TMDL assessment began in 2006. An existing data compilation was completed, and potential risk sources were identified and assigned priorities. Rigorous field sampling events were conducted in April 2007, September 2007, and September 2008 and included water column and sediment samples for benzene, toluene, ethylbenzene, and xylenes (BTEX); polycyclic aromatic hydrocarbon (PAH); and total organic carbon (TOC). Results indicate the water column meets WQS but several sediment results had surface sheening in exceedance of the standard. The original area of impairment has been reduced as a result of the field sampling and includes two nearshore impaired areas and some areas of the harbor found to meet WQS. The TMDL for the remaining impaired areas is scheduled for completion by June 30, 2010. Implementation will focus on dock and harbor BMPs to minimize any new petroleum hydrocarbon inputs to the area.</p>								

## Category 2 Waterbodies

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Region	Category	AK ID Number	Waterbody	Location	Area of Concern	Water Quality Standard	Previous Impairing Pollutant Parameters	Previous Impairing Pollutant Sources
SC	Category 2	20302-601	Eagle River Flats (60 acres)	Fort Richardson	N/A	Toxic & Other Deleterious Organic and Inorganic Substances	White Phosphorus, Munitions Residues	Military Base Operations
<p>This waterbody was placed on the 1996 Section 303(d) list for white phosphorus. An EPA consultant, CH2M Hill prepared a report, <i>Eagle River Flats - Comprehensive Evaluation Report</i>, in July 1994. This report is a detailed environmental assessment that qualifies as a waterbody assessment. The report presents water quality data and other information on the relationship between white phosphorous (from artillery shell residue) and its lethal effect on waterfowl in the Eagle River Flats area. A ROD was signed on September 30, 1998, placing the water in Category 4b. Approximately 60 acres were identified as contaminated and requiring treatment. Remediation activities occurred in 1998–2001. During each field season, six pumping systems were placed into the contaminated ponds and operated to drain the water from the ponds. Draining the ponds allowed the sediments to dry out and caused the white phosphorus to oxidize and no longer be a threat to the waterfowl. Field activities resulted in a dramatic decrease in white phosphorus concentrations in more than half the total acreage identified as contaminated. By 2004, more than 75 percent of the contaminated areas were addressed. The remaining area was treated in 2005, the last year for active treatment. The Army is now in the long-term monitoring phase to ensure that the remedial action will meet the long-term goal of reducing duck mortality to levels identified in the ROD. Additional pumping of water from the ponds and drying of white phosphorus contaminated sediments occurred in 2007. DEC's Contaminated Sites section summary on Eagle River Flats can be viewed at <a href="http://www.dec.state.ak.us/spar/csp/search/csites_report.asp?Reckey=199721X204805">http://www.dec.state.ak.us/spar/csp/search/csites_report.asp?Reckey=199721X204805</a>. DEC considers the Army to have met the milestones in the ROD, and mortality is considered to be at levels typical for the species in this area. This water was removed from Category 4b in 2008.</p>								

A. Waterbody Categories 2 through 5

## Category 2 Waterbodies

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<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
SC	Category 2	30204-023	Eskimo Creek	King Salmon	N/A	<b>Petroleum Hydrocarbons, Oils &amp; Grease; Toxic &amp; Other Deleterious Organic and Inorganic Substances</b>	<b>Petroleum Products, Diesel Range Organics, Trichloroethylene</b>	<b>Landfill, Fuel Storage, Former Underground Storage Tanks, Former Dry Wells (Injection Wells), Military</b>
<p>Eskimo Creek was initially placed on the 1996 Section 303(d) list based on information provided by the EPA's Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or "Superfund" group. Seeps from a fuel storage area, former dry wells, and a dump adjacent to Eskimo Creek led to potential stream water contamination by metals, pesticides, and petroleum hydrocarbons. The waterbody was listed for these parameters in 1996. Later information suggested removing metals and pesticides as a pollutant parameter because no analytical tests support these constituents as contaminants of concern and placement of this segment of Eskimo Creek in Category 2. The primary sources of petroleum hydrocarbons and trichloroethylene (TCE) from aboveground storage tanks and dry wells have been removed. A final ROD for Groundwater Zone 1 was signed by DEC and the Air Force in November/December 2000. A final ROD for Groundwater Zone 2 and a Zone 2 Addendum were signed by DEC in December 2002 and 2003 and by the Air Force in December 2003. Future activities based on the RODs include removal of extruding surface drums and debris and the recontouring and revegetation of the landfill cover; continued operation, maintenance, and monitoring of the biovent systems; monitored natural attenuation of the groundwater; groundwater modeling; continued operation of the water treatment system; annual monitoring of groundwater (A-Aquifer and B-Aquifer) and surface water; implementation and maintenance of institutional controls; and 5-year reviews. The waterbody was placed in Category 2 because WQS are attained for petroleum hydrocarbons, TCE, and diesel-range organics (DRO) in 2002/2003.</p>								
SC	Category 2	20401-412	Hood /Spenard Lake	Anchorage	N/A	<b>Fecal Coliform Bacteria</b>	<b>Fecal Coliform Bacteria</b>	<b>Urban Runoff, Industrial</b>
<p>Hood/Spenard Lake was Section 303(d) listed in 1996 for FC bacteria and was placed in Category 4a because a TMDL for FC bacteria was developed and finalized on September 30, 1997. Review of water quality data from 2000 to 2009 shows that the waters are meeting the FC bacteria standard. The waterbody was moved to Category 2 in 2010. This waterbody remains on the Category 5 Section 303(d) list for low DO.</p>								

## A. Waterbody Categories 2 through 5

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**Category 2 Waterbodies** – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
SC	Category 2	30102-602	Iliuliuk Bay	Unalaska Island		Petroleum Hydrocarbons, Oils & Grease	Petroleum Products	Urban Runoff
Iliuliuk Bay was Section 303(d) listed in 1990 for non-attainment of the petroleum hydrocarbons, oils and grease standard for petroleum products. An EPA study in August 1994, <i>Water Quality Assessment for Greater Unalaska Bay</i> , concluded the waterbody was affected by petroleum products. TMDL assessment began in 2006 with completing an existing data compilation and identifying and prioritizing potential risk sources. Rigorous field sampling events were conducted in April 2007 and September 2007 and included water column and sediment samples for BTEX, PAH, and TOC. All sample results for Iliuliuk Bay indicate the water and sediments are meeting standards for petroleum hydrocarbons. DEC is removing Iliuliuk Bay from the Category 5/Section 303(d) list based on these data in 2010.								
SC	Category 2	20402-409	Jewel Lake	Anchorage	N/A	Fecal Coliform Bacteria	Fecal Coliform Bacteria	Urban Runoff, Land Development
Jewel Lake was Section 303(d) list in 1994 for FC bacteria. A TMDL was developed and finalized on September 30, 1997. Jewel Lake was removed from the Section 303(d) list in 1998. Monitoring results from July through October 2008 and May and June 2009 indicate the water is meeting state WQS for FC bacteria. The waterbody was moved to Category 2 in 2010.								
SC	Category 2	20701-502	Kazakof Bay	Afognak Island	N/A	Residues	Bark & Woody Debris	Log Transfer Facility
This waterbody was placed on the 1998 Section 303(d) list for non-attainment of the residues standard for bark and woody debris. Dive survey information for this LTF (known as Kazakof Bay 1) document exceedances of the bark accumulation level for the interim intertidal threshold (according to the ATTF <i>Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines</i> , October 21, 1985) at 1.2 acres of bottom coverage in February 2000 and at 3.0 acres in February 2001. A March 2004 dive survey report documented 0.20 acre of continuous residue coverage. Therefore, the water was removed from Category 5 (Section 303(d) list) and placed in Category 2 in 2004.								

## Category 2 Waterbodies

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<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
SC	Category 2	20302-005	Kenai River (lower)	Kenai	Slikok Creek (river mile 19.0) to the mouth (river mile 0.0)	Petroleum Hydrocarbons, Oils & Grease	Total Aromatic Hydrocarbons	Motorized Watercraft
<p>The Kenai River was Section 303(d) listed in 2006 for petroleum hydrocarbons (total aromatic hydrocarbon [TAH]). Beginning in 2000 and through 2007, DEC received water quality data that showed exceedances of the Alaska petroleum hydrocarbon water quality standard for TAH during the month of July. A water quality study conducted by DEC in 2003 confirmed the source of the petroleum hydrocarbon pollution was from motorboats. Sampling also indicated detections in the river of no petroleum in May, low levels in June, exceedances in July, low levels in August, and no contamination in September. In 2008, regulatory actions taken by ADF&amp;G and DNR, requiring all outboard engines operating on the Kenai River during the month of July to be either four-stroke or direct fuel injection two-stroke motors, allowed the Kenai River to be moved to Category 4b. Intensive water quality monitoring conducted in July 2008 and 2009 confirmed the actions taken resulted in the Kenai River attaining waterbody standards. The Kenai River was moved to Category 2 in the 2010 Integrated Report. DEC will continue periodic monitoring to ensure WQS are being met.</p>								
SC	Category 2	30203-001	King Salmon Creek	King Salmon	N/A	Petroleum Hydrocarbons, Oils & Grease	Petroleum Products	Landfill, Military, Unknown Drum Contents
<p>This waterbody was placed on the 1996 Section 303(d) list for petroleum hydrocarbons, oils and grease and for metals and pesticides. Monthly influent and effluent samples are analyzed for all potential contaminants of concern. A final ROD for Groundwater Zone 3 was signed by DEC and the Air Force in April 2000. Activities required by the ROD include landfill cover inspection and maintenance; continued operation of the water treatment system; annual monitoring of groundwater (A-Aquifer and B-Aquifer) and surface water; maintenance of institutional controls; and a 5-year review. The extensive sampling program has not identified any exceedances of surface WQS at this site; therefore, the waterbody was placed in Category 2 in 2002/2003.</p>								
SC	Category 2	20701-501	Lookout Cove	Afognak Island	N/A	Residues	Bark & Woody Debris	Log Transfer Facility
<p>Lookout Cove was previously placed on the Section 303(d) list for non-attainment of the residues standard for bark and woody debris. Dive survey information for this LTF from 2002 reported 1.2 acres of continuous residues coverage, and 2003 dive survey information reported 0.7 acre of continuous bottom coverage. These dive surveys document that the residues coverage is less than the 1.5 acres impairment standard for residues; therefore, the waterbody was removed from the Category 5/Section 303(d) list and placed in Category 2 in 2004.</p>								

## A. Waterbody Categories 2 through 5

## Category 2 Waterbodies

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<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
SC	Category 2	30204-001	Naknek River	King Salmon	N/A	<b>Petroleum Hydrocarbons, Oil &amp; Grease; Toxic &amp; Other Deleterious Organic and Inorganic Substances</b>	<b>Petroleum Products, TCE</b>	<b>Landfill, Fuel Storage, Former Marina, Military</b>
<p>Naknek River was Section 303(d) listed in 1996 and was not expected to meet WQS because of pollutant sources coming from tributary waterbodies (Eskimo Creek, King Salmon Creek, and Red Fox Creek). In 1998 Naknek River was removed from the Section 303(d) list because other pollution controls were in place. The primary contaminant sources (a drum storage area and underground storage tanks) were removed prior to 1988. In 1998, and later in 2000, it was determined that this waterbody needed additional monitoring and tracking. Samples were collected from the Naknek River at various locations over the years for laboratory analysis. No results were detected above state and federal regulatory levels. In December 1998, oil sheen was observed on the Naknek River bank adjacent to the King Salmon Morale, Welfare, and Recreation Marina. In 1999 a final ROD was signed by DEC and the Air Force for a groundwater area located approximately 1/2-mile downstream from the main runway at the King Salmon Airport that includes approximately 3,000 feet of the Naknek River's north shore. Future activities identified in the ROD include passive product recovery system operation and maintenance; annual monitoring of groundwater and surface water; landfill cover inspection and maintenance; implementation and maintenance of institutional controls; and a 5-year review. Between September 2002 and January 2003, approximately 1,100 cubic yards of petroleum-contaminated soil was removed. Groundwater, surface water, and sediment monitoring will continue at the marina to evaluate remedial efforts and attenuation processes. No seep or sheen has been observed following the source removal action. Naknek River was placed in Category 2 in 2004.</p>								
IN	Category 2	50404-001	<b>Red Dog Creek, Ikalukrok Creek</b>	<b>Near Red Dog Operation</b>	N/A	<b>Dissolved Inorganic Substances</b>	<b>Total Dissolved Solids</b>	<b>Mining</b>
<p>EPA approved DEC's reclassification of the uses of Red Dog and Ikalukrok creeks for industrial water supply in February 2002. EPA approved a site-specific criterion for zinc in July 1998. The facility was issued a water quality-based permit and the revised permit is an existing control that will bring the waterbody into compliance with applicable WQS (fresh water industrial water supply) for total dissolved solids (TDS), cadmium, lead, selenium, and the site-specific standard for zinc. A site-specific criterion for TDS was developed and approved by EPA on April 21, 2006. In the 1998 Integrated Report, Red Dog and Ikalukrok creeks was placed in Category 4b; however, because of the development of the reclassification, the water-quality based permit, the site specific criteria for zinc and TDS, and both Red Dog Creek and Ikalukrok Creek meeting the 1,500-milligram-per-liter site specific criteria for TDS, these creeks are in attainment of WQS. Therefore, the waterbody was placed in Category 2 in 2006.</p>								

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<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
SC	Category 2	30204-002	Red Fox Creek	King Salmon	N/A	<b>Petroleum Hydrocarbons, Oils &amp; Grease; Toxic &amp; Other Deleterious Organic and Inorganic Substances</b>	<b>Petroleum Products, Diesel Range Organics, Benzene, and Trichloroethylene</b>	<b>Landfill, Fire Training Areas, Military</b>
<p>Red Fox Creek was Section 303(d) listed in 1994 for non-attainment of the petroleum hydrocarbons and oils and grease standard for petroleum hydrocarbons and the toxic and other deleterious organic and inorganic substances standard for metals. Information provided by EPA's CERCLA (or Superfund) group showed that the waterbody was water quality impaired from petroleum hydrocarbons and TCE. Consequently, the metals parameter was dropped from this listing. Water quality assessment studies were completed for the waterbody, and a remediation plan has been implemented. Red Fox Creek formerly consisted of a small stream before construction of the airport runway in the 1940s. It is currently a losing stream with minimal flow that enters the groundwater system as it intersects the runway. Red Fox Creek does not directly affect the Naknek River. Contaminants of concern included DRO, gasoline-range organics (GRO), and benzene in surface water, and DRO, GRO, benzene, toluene, tetrachloroethene, and PAH in sediment. Surface water and sediment sample data from 1997 showed that Red Fox Creek did not meet WQS and was placed in Category 5. The 1997 remedial actions included the secondary source removal and treatment of the contaminated soil in on-facility biocells. The 1998 remedial actions included the installation of an air sparging and soil vapor extraction system. The treatment system had been intermittently and seasonally operated from 1999. The 2001 groundwater samples reveal DRO, GRO, TCE, and benzene above groundwater cleanup levels. During the Remedial Process Optimization Phase II meetings in 2002, which included participants from EPA, DEC, Air Force, Pacific Air Forces, Air Force Center for Environmental Excellence, and consultants, it was agreed that, based on operational data, the system should be converted into a biovent system to more adequately treat the contamination. The conversion occurred in late 2002. No surface water quality criteria were exceeded in 2002 and 2003. Future activities required by the ROD for this site include continued operation and maintenance of the biovent system; monitored natural attenuation of the groundwater; annual groundwater, surface water, and sediment sampling; implementation and maintenance of institutional controls; and 5-year review. This water was removed from Category 5 (Section 303(d) list) and placed in Category 2 in 2004.</p>								

## A. Waterbody Categories 2 through 5

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<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
SC	Category 2	30104-601	Saint Paul Island Lagoon	St. Paul Harbor, St. Paul Island	N/A	Petroleum Hydrocarbons, Oils & Grease	Petroleum Products	Leaking Aboveground Storage Tanks
A segment of Saint Paul Island Lagoon was placed on the 2002/2003 Section 303(d) list for the petroleum hydrocarbons and oils and grease standard for petroleum products. An oil sheen was observed on the water on a daily basis. The pollutant source was a seal processing plant built in 1918 and demolished in 1988 when the commercial seal harvesting ended. Diesel contamination was thought to have been from spillage during fuel handling. An area of approximately 120 feet by 120 feet showed evidence of diesel contamination and extended from the surface to groundwater at 3 to 5 feet. Groundwater movement from the contaminated area threatened uncontaminated wetlands to the west and northwest. The areal extent of contamination was estimated at 10,000 square feet. Leaking aboveground storage tanks and diesel seepage were ongoing into the lagoon from as early as the 1980s. Controls implemented have controlled the sheen; therefore, this water was removed from the Section 303(d) list in 2008.								
SE	Category 2	10302-502	Corner Bay	Tenakee Inlet, Baranof Island	N/A	Residues	Bark & Woody Debris	Log Transfer Facility
This waterbody was placed on the 1998 Section 303(d) list for debris. At that time, dive survey information from May 1996 demonstrated an exceedance of the bark accumulation level for the interim intertidal threshold (according to the ATTF <i>Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines</i> , October 21, 1985) at 1.18 acres of bottom coverage. Dive survey reports from June 2002 of 0.1 acre and from July 2001 of 0.6 acre of bottom coverage document that this water is compliant with standards. This water was removed from the Category 5 (Section 303(d) list) in 2002/2003.								
SE	Category 2	10204-502	Cube Cove	NW Admiralty Island	N/A	Residues	Bark & Woody Debris	Log Transfer Facility
Cube Cove on Admiralty Island in Southeast Alaska was first placed on Alaska's Section 303(d) list in 1998 as impaired for residues from LTF operations. Cube Cove remained on the subsequent 2002/2003 Section 303(d) list. The 1998 Section 303(d) listing criteria required only one dive survey documenting an exceedance of 1.0 acre of continuous coverage bark residues. A January 1998 dive survey documented 9.5 acres of continuous coverage bark on the marine bottom. Subsequent dive surveys document that the Cube Cove LTF has a trend of reduced continuous coverage bark residues. Dive surveys document 1.35 acres in April 2001 and 1.2 acres in December 2002. A February 2004 dive survey documented 0.9 acre of continuous bark residue coverage; therefore, Cube Cove was removed from the Category 5/Section 303(d) list and moved to Category 2 in 2004.								
SE	Category 2	10202-601	Hamilton Bay	Kake	N/A	Residues	Bark & Woody Debris	Log Transfer Facility
This waterbody was placed on the 1994 Section 303(d) list for debris. Past dive surveys had indicated that excessive bark existed on the bottom of Hamilton Bay as a result of logging operations on Kupreanof Island that use the Hamilton Bay LTF. Dive survey reports from September 2000 of 0.6 bottom coverage and the June 2002 of 0.6 acre document that this water is compliant with standards. This water was removed from the Category 5 (Section 303(d) list) in 2002/2003.								

## Category 2 Waterbodies

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<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
SE	Category 2	10202-006	Hammer Slough	Mitkof Island	N/A	Sediment	Sediment	Urban Runoff, Gravel Mining
<p>This waterbody was Section 303(d) listed in 1994. DEC staff has coordinated implementation of best management practices (BMPs) for the waterbody from the responsible parties that have resulted in the waterbody attaining WQS. The water quality data in the file support that the waterbody is no longer impaired. DEC staff inspected the Slough in April 2000 and confirmed that BMP implementation has been accomplished and effective in controlling sedimentation and recommended that this waterbody requires no further action. The water was placed in Category 2 in 2002/2003.</p>								
SE	Category 2	10201-501	Hobart Bay	Mainland, SE Stephens Passage	N/A	Residues	Bark & Woody Debris	Log Transfer Facility
<p>Hobart Bay was Section 303(d) listed in 1998 for non-attainment of the residues standard for bark and woody debris. Dive survey information from May 1996 (LTF known as Hobart Bay 3) documented a significant exceedance of the bark accumulation level for the interim intertidal threshold (according to the ATTF <i>Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines</i>, October 21, 1985) at 2.3 acres of bottom coverage. 1.3 acres of marine bottom adjacent to the LTF was listed as impaired. A 2007 dive survey documented that the LTF and log storage area (LSA) contained no continuous coverage by bark debris and only a few small patches of discontinuous coverage by bark debris. The December 2007 dive survey and assessment document that this facility is attaining WQS. The water was removed from the Section 303(d) in 2008.</p>								
SE	Category 2	10103-502	Klawock Inlet	Klawock Island, W. Prince of Wales Island	N/A	Residues	Bark & Woody Debris	Log Transfer Facility
<p>The area just off the dock and log transfer area at Klawock Inlet was Section 303(d) listed in 2002/2003 for non-attainment of the residues standard for bark and woody debris. A dive survey conducted by the operator of the facility in February 2004 documented 1.0 acre of continuous residues coverage, and a subsequent dive survey report in November 2004 documents continuous residues coverage at 0.5 acre. Two consecutive dive survey reports document that continuous residue coverage is less than the 1.5-acre impairment standard. Therefore, this waterbody was removed from the Category 5/Section 303(d) list in 2006.</p>								

## A. Waterbody Categories 2 through 5

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<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
SE	Category 2	10203-001	Nakwasina River	Baranof Island, Sitka	8 miles	Sediment, Turbidity	Sediment, Turbidity	Timber Harvest
Nakwasina River was placed on the 1998 Section 303(d) list for non-attainment of the sediment and turbidity standards. Past land use activities had created a number of concerns about water quality and fish habitat. The harvest of riparian timber and the location and lack of maintenance of the road system created the following conditions: decreased channel stability, landslides and small slope failures, increased sediment levels, loss of aquatic habitat, siltation of holding pools for migrating salmon, and alteration of watershed hydrology. Watershed effects resulted in use impairment for aquatic life. The U.S. Forest Service (USFS) submitted a 2-year Water Quality and Aquatic Habitat Restoration Assessment in February 2009 and recommended removal from the 303(d) list based on its results. The data demonstrate that turbidity levels have decreased below state WQS. The waterbody was moved to Category 2 in 2010.								
SE	Category 2	10202-801	Point Macartney	Kupreanof Island, Kake	N/A	Residues	Bark & Woody Debris	Log Transfer Facility
This waterbody was Section 303(d) listed for residues in 1998. Dive survey information documented an exceedance of bark accumulation level for the interim intertidal threshold (according to the <i>Log Transfer Facility Siting, Construction, Operation, and Monitoring/Reporting Guidelines</i> , October 21, 1985) from February 2001 at 1.2 acres of bottom coverage. A dive survey report from March 2002 documents 1.0 acre of bottom coverage, and another dive survey report from November 2002 reported 0.52 acre. These findings validate that this water is compliant with standards. This water was removed from the Category 5 (Section 303(d) list) in 2002/2003.								
SE	Category 2	10202-602	Rowan Bay	Kuiu Island	N/A	Residues	Bark & Woody Debris	Log Transfer Facility
This waterbody was placed on the 1996 Section 303(d) list for debris (bark debris from deposition at an LTF). Past dive surveys have shown an exceedance of the bark accumulation level for the interim intertidal threshold (according to the <i>Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines</i> , October 21, 1985). Dive survey reports from May 2002 of 0.8 acre and from June 2001 of 0.6 acre of bottom coverage document that this water is compliant with standards. This water was removed from the Category 5 (Section 303(d) list) in 2002/2003.								
SE	Category 2	10202-802	Saginaw Bay	Kuiu Island	N/A	Residues	Bark & Woody Debris	Log Transfer Facility
This waterbody was placed on the Section 303(d) list for excessive residues associated with an LTF. Dive survey information from 2001 documented a significant exceedance of the bark accumulation level for the interim intertidal threshold (according to the <i>Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines</i> , October 21, 1985) at 1.7 acres of bottom coverage. A dive survey report from May 2002 documents 0.7 acre of bottom coverage and validates that that this water is compliant with standards. This water was removed from the Category 5 (Section 303(d) list) in 2002/2003.								

## Category 2 Waterbodies

### Alaska's 2010

#### Integrated Water Quality Monitoring and Assessment Report

**Category 2 Waterbodies** – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
SE	Category 2	10203-502	Saint John Baptist Bay	Baranof Island	N/A	Residues	Bark & Woody Debris	Log Transfer Facility
Dive survey information from September 2000 documented a significant exceedance of the bark accumulation level for the interim intertidal threshold (according to the ATTF <i>Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines</i> , October 21, 1985) at 1.32 acres of bottom coverage. Saint John Baptist was considered for Category 5/Section 303(d) listing during the 2002/2003 Integrated Report development process, but the facility came into compliance with the residues impairment standard. A dive survey report from June 2002 documented 0.2 acre of bottom coverage and validates that that this water is compliant with the residues standard.								
SE	Category 2	10203-504	Salt Lake Bay	Port Frederick, Chichagof Island	N/A	Residues	Bark & Woody Debris	Log Transfer Facility
This waterbody was placed on the 1998 Section 303(d) list for debris. Dive survey information from October 1991 demonstrated an exceedance of the bark accumulation level for the interim intertidal threshold (according to the <i>Log Transfer Facility Siting, Construction, Operation, and Monitoring/Reporting Guidelines</i> , October 21, 1985) at 1.16 acres of bottom coverage. Dive survey reports from May 2002 of 0.1 acre and from March 2000 of 0.3 acre of bottom coverage document that this water is compliant with standards. This water was removed from Category 5 (Section 303(d) list) in 2002/2003.								

## Category 2 Waterbodies

### Alaska's 2010

#### Integrated Water Quality Monitoring and Assessment Report

**Category 2 Waterbodies** – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
SE	Category 2	10303-006	Sawmill Creek	Haines	N/A	Residues	Debris	Urban Runoff
<p>This waterbody was never Section 303(d) listed for debris, but was placed in Category 4b in 1996. Some debris removal work, in addition to a culvert replacement and reseeded, was completed in 1997. The debris was attributed to highway and maintenance sources. Plans called for moving the stream away from the highway/street in two areas and constructing a dike in another. Plans also called for establishing vegetative buffers, swales, and matting to improve filtration of runoff entering the stream. Priority actions for this water included designing and implementing an interagency watershed assessment and a recovery plan; establishing water quality monitoring objectives and implementing a water quality monitoring plan; and working with city of Haines to review and develop stormwater plans in accordance with EPA and DEC requirements. An extensive residues cleanup was undertaken in 2006 and 2007 and provided removal of 27,000 pounds of scrap metal and 33 bags of trash. The bulk of the debris removed in 2007 was from legacy activities, including abandoned vehicles used for stream bank stabilization. Control measures are in place to prevent similar activities from occurring in the future (state and federal laws), however, more importantly, public acceptance of using abandoned vehicles for stream bank stabilization is no longer tolerated. Enforcement by the City and Borough of Haines police department also has reduced such types of illegal disposal practices. Spring cleanup events occur annually in the City of Haines. DEC does not have the resources to document litter trends in areas outside of Juneau. DEC relies on the best professional judgment from state and federal agencies and on credible information from the local watershed group (Takshanuk Watershed Council) to establish whether the creek meets WQS for debris. The majority of debris within the creek, for which the water was placed in Category 4b originally, has been removed. Any remaining or future debris/residues problems are not unlike those of other urban Alaskan waterways and are being addressed by the City of Haines. Consequently, it has been determined that the waterbody meets the residues criterion, and the waterbody was moved from Category 4b to Category 2 in 2008.</p>								
SE	Category 2	10203-503	Schulze Cove	Fish Bay, Baranof Island	N/A	Residues	Bark & Woody Debris	Log Storage Area
<p>This section of Schulze Cove was Section 303(d) listed in 1998 for non-attainment of the residues standard for bark and woody debris. The Schulze Cove LSA covers the whole Cove. Review of USF&amp;WS video documentation and dive report (September 1995 report on dives from July 27 and 29, 1995, several transects) revealed extensive bark deposition (more than 1 acre in area and 10 centimeters [cm] in thickness). Historically, log storage activities have severely affected Schulze Cove. A December 2007 dive survey and assessment documents that this waterbody is attaining WQS and consequently removed from the Section 303(d) list in 2008. The 2007 dive assessment work used a parallel pattern to survey the site and consisted of 17 transects at 300-foot spacing intervals. The sample point frequency was at 300-foot intervals using visual survey methods. The survey documented that the LSA contained no continuous coverage by bark debris and 25.02 acres of discontinuous coverage by bark debris. The 2007 dive survey and assessment documents that this facility is attaining WQS and consequently removed from the Section 303(d) list in 2008.</p>								

## A. Waterbody Categories 2 through 5

## Category 2 Waterbodies

Alaska's 2010

## Integrated Water Quality Monitoring and Assessment Report

**Category 2 Waterbodies** – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
SE	Category 2	10103-602	Thorne Bay (Log Storage Area)	Prince of Wales Island	N/A	Residues	Bark & Wood Debris	Historical Log Transfer Facility
<p>The Thorne Bay historical marine LTF, which consisted of both a nearshore log transfer area and an associated LSA, was Section 303(d) listed in 1994 for non-attainment of the residues standard for bark and wood debris. Log transfer and storage activities began in 1962 and caused the accumulation of woody debris on the bottom of the head of Thorne Bay. Log transfer and storage activities ended in 2000, and the operator, USFS, does not plan to resume them; all equipment and facilities have been removed. A key feature of the recovery of the former log transfer and storage area is the Thorne River, which empties into the bay and deposits sediments onto a large sand and gravel delta, where they mix with debris and aid in biological recovery. The Log Storage Area: Dive surveys of the LSA conducted in July 2001 and June 2002 documented 1.1 acres of bark and wood debris on the marine bottom. Dive surveys in 2003 and 2005 detailed the benthic health of 161 acres of the former LSA. Findings included the following: (1) bark debris was mostly decomposed to small fragments and was mixed with natural sediments; (2) the bottom was biologically recovered, exhibiting mostly mature “Stage III” biological communities; and (3) the site was an “extremely healthy coastal embayment.” DEC determined, based on the detailed benthic assessment, that the residues standard is met in the former LSA. DEC removed the LSA from the Section 303(d) list and placed it in Category 2 in 2004. The LSA remained in Category 2 with no known impairments. The Log Transfer Facility: Dive surveys conducted in 1988 and 1990 documented approximately 55 acres of bark accumulation in the LTF. Dive surveys of the LTF conducted in July 2001 and June 2002 documented 2.6 and 1.1 acres of bark and wood debris, respectively, on the marine bottom. An April 2004 dive survey of the LTF documented 6.5 acres of bark and woody debris. The former LTF remained on the Section 303(d) list for a defined area of approximately 35 acres between the LTF shoreline and the boundary of the former LSA established in the 2003-2005 benthic assessment. A December 2007 dive survey documented a reduced area of impaired marine bottom of only 7.5 acres and the rest of the previous area of impairment as meeting the residues criterion and attaining WQS. These findings suggest that biological recovery is proceeding and is well advanced within the area associated with the LTF. A residues TMDL for the Thorne Bay LTF was completed and approved by EPA on May 8, 2007. With the completed TMDL, the LTF was removed from the Section 303(d) list and placed in Category 4a in 2008 with an approved TMDL for residues.</p>								
SE	Category 2	10103-802	Tolstoi Bay	NW Bight of Tolstoi Bay, Prince of Wales Island	N/A	Residues	Bark & Woody Debris	Log Storage Area
<p>Tolstoi Bay had been on the Section 303(d) list since 1998 for non-attainment of the residues standard for bark and woody debris. A dive survey report from June 1994 for this area (known as Tolstoi Bay 2) reported 1.82 acres of bottom coverage from debris. A March 2003 dive survey report showed 0.7 acre of bark on the bottom. Therefore, the waterbody was removed from the Category 5/Section 303(d) list and moved to Category 2 in 2002/2003.</p>								

## Category 2 Waterbodies

### Alaska's 2010

#### Integrated Water Quality Monitoring and Assessment Report

**Category 2 Waterbodies** – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
SE	Category 2	10102-502-001	Tongass Narrows 1	Tongass Narrows, Eastern Channel, SE of Thomas Basin	N/A	Residues	Seafood Residues, Seafood Processing Wastes	Seafood Processing Facility
<p>This waterbody segment was placed in Category 4b for residues in 2002/2003. The seafood processing facility exceeded its 1 acre ZOD standard for residues associated with its discharge permit, and EPA issued a compliance order/consent decree from for non-compliance with its waste discharge limitations. Additionally the facility has discharged seafood sludge, deposits, debris, scum, floating solids, oily wastes, or foam, which alone or in combination with other substances cause a film, sheen emulsion, or scum on the surface of the water. A 2005 dive survey reported a reduction of 0.31 acre from the 2004 survey, with a total acreage of 1.22, and compliance with the residues impairment standard. Additionally, the EPA Region 10 compliance unit reported that the pile size of the seafood processing was 0.5 acre and that the facility was in compliance with the consent decree and its NPDES permit. Consequently, Tongass Narrows 1 was moved from Category 4b to Category 2 in 2006.</p>								
SE	Category 2	10102-502-002	Tongass Narrows 2	Tongass Narrows, Eastern Channel, SE of Thomas Basin	N/A	Residues	Seafood Residues, Seafood Processing Wastes	Seafood Processing Facility
<p>This waterbody segment was placed in Category 4b for residues in 2002/2003. Previously, the seafood processing facility exceeded its 1-acre ZOD standard for residues associated with its discharge permit and was under an EPA compliance order for non-compliance with its waste discharge limitations. Additionally, the facility had discharged seafood sludge, deposits, debris, scum, floating solids, oily wastes, or foam, which alone or in combination with other substances cause a film, sheen emulsion, or scum on the surface of the water. EPA conducted a compliance inspection of this facility in fall 2006. Reports from this compliance inspection found that the ZOD was less than 1.0 acre, at 0.5 acre, and the facility was compliant with the consent decree and its NPDES permit. This waterbody segment is now meeting WQS and was moved from Category 4b to Category 2 in 2008.</p>								

## A. Waterbody Categories 2 through 5

## Category 2 Waterbodies

Alaska's 2010

## Integrated Water Quality Monitoring and Assessment Report

**Category 2 Waterbodies** – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
SE	Category 2	10103-503	Twelvemile Arm	Prince of Wales Island	N/A	Residues	Bark & Woody Debris	Log Storage Area
<p>Twelvemile Arm had been on the Section 303(d) list since 1998 for non-attainment of the residues standard for bark and woody debris. Review of USF&amp;WS video documentation and a dive transect conducted in 1997 revealed 100% coverage along an entire transect and numerous sections exceeding 10 cm in thickness, i.e., extensive bark deposition (more than 1 acre in are and more than 10 cm in thickness). Log storage activities had been conducted at the head of the arm in a shallow area lacking sufficient flushing capability. The log storage site is inactive and there have been no new sources of residues. A December 2007 dive survey and assessment documented that this water was meeting the residues criterion and attaining WQS. The 2007 survey documented that the LSA contained no continuous coverage by bark debris and only a few small patches of discontinuous cover by bark debris. The use of plan-view video and dive survey methods quantified the extent and type of both continuous and discontinuous coverage as 0.00 acres of bark debris. The 2007 dive survey and assessment documented that this water is meeting the residues criterion and attaining WQS. The water was removed from the Section 303(d) list in 2008.</p>								
SE	Category 2	10102-601	Ward Cove	Ketchikan	80 acres	Toxic & Other Deleterious Organic and Inorganic Substances – Sediment Toxicity	Pulp Residues, Logs, Bark & Woody Debris, Sediment Toxicity due to Wood Decomposition By-products	Industrial
<p>DEC and EPA determined that the approved and final ROD of the Superfund cleanup for the “Ketchikan Pulp Company, Marine Operable Unit, Ketchikan, Alaska” (March 29, 2000) were adequate “other pollution controls” for sediment toxicity (4-methyl phenol, ammonia, sulfides) in Ward Cove. Three acres have been dredged in the area of concern, in addition to thin capping of approximately 30 acres of the marine bottom. Monitoring in 2004 showed that thin layer capping was successful in eliminating sediment toxicity and stimulating colonization by bottom-dwelling invertebrate species. In May 2009 EPA determined that the Ward Cove sediment cleanup monitoring was complete and objectives had been achieved. Regular monitoring of the sediments since cleanup have shown that cleanup goals have been met. Consequently, the Superfund portion of Ward Cove has been moved to Category 2 in 2010.</p>								
SE	Category 2	10203-804	West Port Frederick	Chichagof Island	N/A	Residues	Bark & Woody Debris	Log Transfer Facility
<p>This waterbody was placed on the 1998 Section 303(d) list for debris. Dive survey information from April 1995 demonstrated an exceedance of the bark accumulation level for the interim intertidal threshold (according to the <i>ATTF Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines</i>, October 21, 1985) at 1.35 acres of bottom coverage. Dive survey reports from April 2001 of 0.3 acre and from March 2000 of 0.3 acre of bottom coverage document that this water is compliant with standards. The water was removed from the Section 303(d) list in 2002/2003.</p>								

## Category 2 Waterbodies

### Alaska's 2010

#### Integrated Water Quality Monitoring and Assessment Report

**Category 2 Waterbodies** – attaining some uses but insufficient or no data and information to determine whether remaining uses are attained

<i>Region</i>	<i>Category</i>	<i>AK ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Previous Impairing Pollutant Parameters</i>	<i>Previous Impairing Pollutant Sources</i>
<b>SE</b>	<b>Category 2</b>	<b>10203-018</b>	<b>Wrinkleneck Creek Swan Lake</b>	<b>Sitka</b>	<b>N/A</b>	<b>Residues</b>	<b>Solid Waste</b>	<b>Urban</b>
<p>This waterbody was placed on the 1996 Section 303(d) list for residues from trash and urban debris. The Swan Lake Watershed Recovery Strategy and TMDL were completed (January 2000) and approved by EPA (May 2000). In 1999 volunteers collected more than 6,600 pounds of trash and debris. In spring 2002, the City and Borough of Sitka (CBS) completed the third annual Swan Lake Cleanup. Each year the amount collected has been lower than previous years. This cleanup will continue to be an annual event in coordination with a citywide spring clean up. The success of these efforts reflects the community's commitment and the approach of the Swan Lake Watershed Recovery Strategy. CBS believes the actions to date support moving the Swan Lake watershed to Category 2. Swan Lake watershed has an implemented waterbody recovery plan and an approved TMDL, including annual cleanups and monitoring. CBS has provided the documentation confirming that it is implementing the TMDL and the waterbody is meeting WQS. DEC has concurred that the waterbody is attaining standards and placed the waterbody in Category 2 in 2002/2003.</p>								

## A. Waterbody Categories 2 through 5

## Category 3 Waterbodies

## Alaska's 2010

**Category 3 Waterbodies** – Waters for which there is insufficient or no data and information to determine whether any designated use is attained

## NOTE:

- DEC has limited information on the following waters to make an attainment or impairment determination. Data are available upon request.
- Regions are abbreviated as follows: IN – Interior, SE – Southeast, and SC – Southcentral.
- Within the Alaska waterbody identification number (WBID #), the first five numbers indicate in which USGS hydrologic unit code (i.e., HUC”) the waterbody is located.

Region	Waterbody Name	Assessment Unit ID
SC	Anchor River	AK-20301-004
IN	Anvil Creek	AK-50104-008
SE	Auke Bay	AK-10301-501
SE	Auke Lake	AK-10301-403
SE	Auke Nu Cove	AK-10301-801
SE	Auke Nu Creek	AK-10301-008
SC	Barbara Creek	AK-20301-017
SC	Beach @ Bluff Point	AK-20301-801
SE	Beach @ City Park	AK-10202-804
SE	Beach @ Douglas Harbor	AK-10301-803
SC	Beach @ Homer Spit	AK-20301-802
SC	Beach @ Kanakanak (Dillingham)	AK-30304-801
SC	Beach @ King Salmon	AK-30204-801
SC	Beach @ Kvichak Bay (Naknek)	AK-30204-802
SE	Beach @ Letnikof Cove	AK-10303-802
SE	Beach @ Lutak Inlet	AK-10303-801
SC	Beach @ Naknek River	AK-30204-803
SC	Beach @ North Kenai	AK-20302-801
SE	Beach @ Petroglyph Beach	AK-10202-806
SC	Beach @ Point Woronzof	AK-20401-801
SE	Beach @ Portage Cove Boat Harbor	AK-10303-803
SE	Beach @ Sandy Beach	AK-10301-805
SE	Beach @ Sandy Beach Park	AK-10202-805
SC	Beach @ Scandinavian Beach	AK-30304-802
SC	Beach @ Snag Point	AK-30304-806
IN	Beach @ West Beach	AK-50104-802
SC	Bear Cove	AK-20301-506

A. Waterbody Categories 2 through 5

Region	Waterbody Name	Assessment Unit ID
SC	Bear Creek (Becharof)	AK-30203-002
IN	Bear Creek (Hogatza)	AK-40608-002
SC	Bear Creek (Homer)	AK-20301-021
SC	Bear Creek (Hope)	AK-20302-013
IN	Bear Creek (Salchaket Slough)	AK-40507-006
SC	Beaver Creek	AK-20302-007
SC	Beaver Inlet	AK-30102-608
SC	Beaver Lake	AK-20701-406
SC	Bell Flats	AK-20701-701
SC	Beluga Lake (Homer)	AK-20301--401
SC	Beluga Slough	AK-20301-028
SC	Benny Creek	AK-20301-020
SE	Berners Bay	AK-10301-502
SC	Bidarka Creek	AK-20301-006
SC	Bidarka Creek	AK-20301-006
SC	Birch Creek (Talkeetna)	AK-20505-009
IN	Birch Lake	AK-40507-402
SE	Black Bear Creek	AK-10103-023
SC	Bodenburg Creek	AK-20402-003
IN	Bolio Lake	AK-40504-401
IN	Bons Creek	AK-50404-002
SE	Bradfield River	AK-10101-001
SC	Bridge Creek	AK-20301-007
SC	Busch Creek	AK-20501-001
SC	Buskin Lake	AK-20701-407
SC	Buskin River	AK-20701-002
SC	Cache Creek	AK-20504-001
SC	California Creek	AK-20401-415
IN	Camp Creek (Nulato)	AK-40705-002
SC	Canoe Lake	AK-20505-411
SE	Carlanna Creek	AK-10102-003
SC	Cedar Bay	AK-20201-501
IN	Chatanika River	AK-40509-002
SC	China Poot Bay	AK-20301-601
SC	China Poot Creek	AK-20301-013
SC	Chuitna River	AK-20601-001
SC	Clear Creek	AK-20503-001
IN	Clearwater Creek	AK-40503-001
IN	Clearwater Lake	AK-40503-402
IN	Colleen Lake	AK-60402-401
IN	Colville River/Umiat Lake	AK-60303-001
SC	Connors Lake	AK-20401-408
SC	Cook Inlet (upper)	AK-20401-601
SC	Cooper Creek	AK-20302-011

A. Waterbody Categories 2 through 5

Region	Waterbody Name	Assessment Unit ID
SC	Copper River	AK-20104-001
SC	Cottonwood Lake	AK-20505-403
SE	Crab Bay	AK-10203-501
SC	Crow Creek	AK-20401-416
SC	Dark Lake	AK-20701-402
SC	Deep Creek	AK-20301-002
SC	Delong Lake	AK-20401-423
SC	Deshka River (Kroto Creek)	AK-20505-010
SC	Diamond Creek	AK-20301-008
SE	Dog Salmon Creek	AK-10103-007
SC	Dogfish Bay (Koyuktoik Bay)	AK-20301-018
SC	Donlin Creek	AK-30501-002
SE	Dora Bay	AK-10103-001
SE	Dora Lake	AK-10103-401
IN	Dry Creek (Nome)	AK-50104-010
SC	East Creek	AK-20301-019
SC	Edmonds Lake	AK-20401-424
SC	Eklutna River	AK-20402-403
SC	Eldred Passage	AK-20301-501
SE	Elfin Cove	AK-10203-805
SC	English Bay River	AK-20301-014
SC	Eyak River	AK-20104-002
SE	Falls Creek (Gustavus)	AK-10302-001
SC	Falls Creek (Kachemak)	AK-20302-101
SC	Finger Lake	AK-20505-404
SE	Fire Cove	AK-10103-005
SC	Fire Lake	AK-20302-401
IN	Fortymile River	AK-40104-001
IN	Fourth of July Creek	AK-40401-001
SC	Fourth of July Creek (Seward)	AK-20202-002
SC	Fox Creek	AK-20301-012
SE	Freshwater Creek	AK-10203-006
SC	Fritz Creek	AK-20301-009
SC	Funny River	AK-20302-006
SE	Gastineau Channel	AK-10301-802
SE	Gastineau Channel (Harris and Aurora Harbors)	AK-10301-804
SC	Gibson Cove	AK-20701-605
SC	Glacier Creek (Girdwood)	AK-20401-414
IN	Glacier Creek (Kantishna Creek)	AK-40510-002
SC	Goodnews River	AK-30502-004
SC	Goose Bay	AK-20505-501
SC	Goose Creek	AK-20505-008
SC	Goose Lake	AK-20401-409
SE	Greens Creek	AK-10204-001

A. Waterbody Categories 2 through 5

Region	Waterbody Name	Assessment Unit ID
SC	Gulkana River	AK-20102-001
SE	Gunnuk Creek	AK-10202-001
SC	Halibut Cove	AK-20301-502
SE	Harris River	AK-10103-008
SE	Hatchery Creek	AK-10103-009
SE	Hawk Inlet	AK-10204-501
SE	Herring Bay Creek	AK-10102-004
SC	Hidden Lake	AK-20401-410
SC	Hideway (Hidden) Lake	AK-20401-010
SE	Hoadley Creek	AK-10102-005
IN	Hogatza River	AK-40608-001
SC	Homer Harbor	AK-20301-505
SC	Horseshoe/Island Lakes	AK-20701-405
IN	Hospital Lake	AK-40205-401
SC	Iliamna Lake	AK-30206-401
IN	Illinois Creek	AK-40703-001
SE	Indian River	AK-10203-007
SC	Jakolof Bay	AK-20301-011
SC	Jim Creek	AK-20402-004
SC	Jim Lake	AK-20402-402
SE	Johnson Creek	AK-10301-009
SC	Jones Lake	AK-20401-405
SC	Juneau Creek	AK-20302-003
SC	Kachemak Bay	AK-20301-504
SC	Kalmbach Lake	AK-20505-410
SC	Kanektok River	AK-30502-001
IN	Kantishna River	AK-40510-001
SC	Kasilof River	AK-20301-015
SC	Kaskanak Creek	AK-30206-001
SE	Ketchikan Creek	AK-10102-006
SE	Kendrick Creek	AK-10103-010
SE	Klehini/Chilkat River	AK-10303-001
SC	Klutina River	AK-20102-002
IN	Kobuk River	AK-50304-001
SC	Kodiak Landfill Creek	AK-20701-001
SC	Koktuli River - North Fork	AK-30302-001
IN	Kotzebue	AK-50301-401
IN	Kotzebue Estuary	AK-50403-601
IN	Kotzebue Lagoon	AK-50301-601
IN	Kuparuk River	AK-60401-001
SC	Kuskokwim River	AK-30502-003
SE	Lab Bay	AK-10103-803
SC	Lake Clark	AK-30205-401
SE	Lake Creek	AK-10301-012

A. Waterbody Categories 2 through 5

Region	Waterbody Name	Assessment Unit ID
SC	Lake Louise	AK-20501-401
IN	Lake McDermott	AK-60402-402
SC	Lake Otis	AK-20401-404
IN	Lignite Creek	AK-40508-002
SC	Lilly Lake	AK-20701-404
SE	Little Auke Creek	AK-10301-007
SC	Little Campbell Lake	AK-20401-413
IN	Little Creek, south fork (Nome)	AK-50104-009
SC	Little Susitna River	AK-20505-004
SC	Little Tutka Bay	AK-20301-510
SC	Lost and Found Lake	AK-20301-402
SC	Lost Harbor	AK-30102-501
SC	Lower Fire Lake	AK-20401-422
SC	Lower Talarik Creek	AK-30206-002
SE	Lutak Inlet	AK-10303-602
SE	Margaret Creek	AK-10102-002
SC	Mariner Creek	AK-20301-026
SC	McClure Bay	AK-20202-601
IN	McDonald Creek (Salchaket Slough)	AK-40507-005
SE	McKenzie Inlet	AK-10103-002
SC	McKinley Lake	AK-20201-402
SC	McNeil Creek	AK-20301-010
SC	McRoberts Creek	AK-20402-005
SC	Meadow Creek	AK-20505-006
SC	Meadow Lake	AK-20401-411
SC	Memory Lake	AK-20505-405
SE	Mendenhall River	AK-10301-006
SC	Millard Bay	AK-20301-508
SC	Mills Creek	AK-20302-001
IN	Minook Creek	AK-40404-001
SC	Mirror Lake	AK-20401-401
SC	Mission Lake	AK-20701-403
SE	Montana Creek (Juneau)	AK-10301-002
SC	Montana Creek (Talkeetna)	AK-20505-008
IN	Moose Creek	AK-40507-001
SC	Moose River	AK-20302-009
SE	Mosquito Lake	AK-10303-401
SC	Mud Bay (Homer)	AK-20301-520
SC	Mulchatna River	AK-30302-003
SC	Nahodak Creek	AK-20301-022
SC	Nancy Lake	AK-20505-406
SE	Nataga Creek	AK-10303-003
SC	Neptune Bay	AK-20301-507
SC	Nilumat Creek	AK-30502-002

A. Waterbody Categories 2 through 5

Region	Waterbody Name	Assessment Unit ID
SC	Ninilchik River	AK-20301-005
IN	Nome River	AK-50104-003
SE	North Twin Lakes	AK-10301-401
SC	Nushagak River	AK-30304-002
SE	One Mile Creek	AK-10303-002
SE	Ophir Creek	AK-10401-001
SC	Orca Inlet	AK-20201-801
SC	Palmer Creek (Homer)	AK-20301-023
SC	Passage Canal (Whittier Harbor)	AK-20202-501
SE	Pavlof River	AK-10203-004
SC	Paxson Lake	AK-20102-401
SC	Peters Creek	AK-20401-001
SC	Peterson Bay	AK-20301-503
SE	Peterson Creek	AK-10301-010
IN	Pile Driver Slough	AK-40507-002
IN	Port Clarence	AK-50104-801
SC	Port Valdez	AK-20201-602
SC	Port Valdez Small Boat Harbor	AK-20201-603
SC	Potato Patch Lake	AK-20701-401
SC	Potter Creek	AK-20401-021
SC	Quartz Creek	AK-20302-008
IN	Quartz Lake	AK-40507-401
SC	Rabbit Creek	AK-20401-007
SC	Red Devil Creek	AK-30501-001
SC	Resurrection Creek	AK-20302-002
SC	Rice Creek	AK-20301-024
SC	Robe Lake	AK-20201-403
IN	Rogge Creek	AK-40505-001
SC	Ruby Creek	AK-20301-025
SC	Russian Creek	AK-20701-003
IN	Sagavanirktok River	AK-60402-001
SC	Saint Paul Harbor	AK-20701-503
SE	Salmon Creek	AK-10301-011
SC	Salmon River (Kinegnak)	AK-30502-005
SE	Sawmill Creek (Sitka)	AK-10203-008
SE	Sawmill Creek (Sitka)	AK-10203-009
SC	Scheffler Creek	AK-20202-004
SE	Schoenbar Creek	AK-10102-007
SC	Seldovia Bay	AK-20301-602
IN	Shaw Creek	AK-40507-004
IN	Sheenjok River	AK-40205-001
SE	Shoal Cove	AK-10102-503
SE	Shoal Creek	AK-10102-001
SE	Shoemaker Bay	AK-10102-603

A. Waterbody Categories 2 through 5

Region	Waterbody Name	Assessment Unit ID
IN	Shovel Creek	AK-50104-006
IN	Sinuk River	AK-50104-004
SE	Sitka Channel	AK-10203-807
SE	Sitka Sound	AK-10203-806
SE	Situk River	AK-10401-002
SC	Sleepy Bay	AK-20202-801
SC	Slikok Creek	AK-20302-010
IN	Snake River	AK-50104-002
SC	Soldotna Creek	AK-20302-004
IN	Solomon River	AK-50104-001
IN	Solomon River, East Fork	AK-50104-007
SE	South Twin Lakes	AK-10301-402
SC	Spring Creek	AK-20402-006
SC	Spring Creek (Seward)	AK-20202-003
SC	Stariski Creek	AK-20301-003
SC	Sundi Lake	AK-20401-406
SE	Sunshine Cove	AK-10203-809
SC	Sunshine Creek	AK-20503-003
IN	Suqitughneq River	AK-50101-001
SC	Susitna River	AK-20505-007
SC	Sweeper Cove	AK-30103-501
SC	Sweeper Creek	AK-30103-001
SE	Taku River	AK-10301-018
SC	Talkeetna River	AK-20503-002
IN	Tanana River	AK-40506-010
SE	Thorne River Estuary	AK-10103-603
IN	Tisuk River	AK-50104-005
SE	Tolstoi Bay	AK-10103-802
SE	Tolstoi Bay Watershed	AK-10103-501
SE	Tongass Narrows, Refuge Cove	AK-10102-801
SC	Town Lake	AK-20102-402
IN	Troutman Lake	AK-50101-401
SE	Turnaround Creek	AK-10203-003
SC	Tuxedni Bay	AK-20602-601
SC	Twitter Creek	AK-20301-016
SC	Two Moon Bay	AK-20201-802
SC	Ugashik River	AK-30202-001
SC	Unalaska Lake	AK-30102-401
SC	Unnamed Creek (City of Kenai)	AK-20302-012
IN	Unnamed Lake	AK-40506-401
IN	Unnamed Lake (Chena Hot Springs Rd.)	AK-40506-401
SC	Upper Bonnie Lake	AK-20402-404
SC	Upper Fire Lake	AK-20401-407
SC	Walby Lake	AK-20402-401

**A. Waterbody Categories 2 through 5**

<b>Region</b>	<b>Waterbody Name</b>	<b>Assessment Unit ID</b>
SC	Wasilla Creek	AK-20505-002
SC	Wasilla Lake	AK-20505-402
SE	Whale Passage	AK-10103-004
SC	Whittier Creek	AK-20202-001
SC	Willow Creek	AK-20505-003
SE	Winter Harbor	AK-10103-006
SC	Women's Bay	AK-20701-802
SC	Wood River	AK-30304-001
SC	Woodard Creek	AK-20301-001
SE	Wrangell Narrows	AK-10202-803
IN	Wulik River	AK-50404-003
SE	Zinc Creek	AK-10204-002

A. Waterbody Categories 2 through 5

**Category 4a Waterbodies**

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**Category 4a Waterbodies** – TMDL has been completed, impaired water.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
<b>IN</b>	<b>Category 4a</b>	<b>40402-001</b>	<b>Birch Creek Drainage:- Upper Birch Creek; Eagle Creek; Golddust Creek</b>	<b>North of Fairbanks</b>	<b>N/A</b>	<b>Turbidity</b>	<b>Turbidity</b>	<b>Placer Mining</b>
<p>Birch Creek has been Section 303(d) listed since 1992 for turbidity as a result of placer mining activity within the drainage. A TMDL was developed and finalized on October 10, 1996. In 1998 Birch Creek was removed from the Section 303(d) list. The waterbody remains in Category 4a because a TMDL has been developed for this waterbody. Priority actions for this water include continued NPDES inspections to monitor reduction of discharges from active mine sites, particularly during storm events; continued implementation of reclamation activities in key areas to address high-priority nonpoint source problems, and monitoring at key sites in the drainage to determine the extent of the water quality improvements. The U.S. Bureau of Land Management conducted water quality sampling in 2004, 2005, 2007, 2008, and 2009. Data are still being reviewed and will be submitted to DEC when finalized. A review of the data from DEC staff will be completed to determine whether removal from the 4a list is warranted.</p>								
<b>IN</b>	<b>Category 4a</b>	<b>40506-009</b>	<b>Garrison Slough</b>	<b>Eielson Air Force Base</b>	<b>N/A</b>	<b>Toxic &amp; Other Deleterious Organic and Inorganic Substances</b>	<b>Polychlorinated Biphenyls</b>	<b>Military Base/ Operations</b>
<p>Garrison Slough was placed on the 1996 Section 303(d) list for polychlorinated biphenyls (PCBs), a TMDL was developed in 1996, and the water was removed from the Section 303(d) list in 1998. Sediment and fish samples from the slough contained elevated levels of PCBs. The source of the PCBs was traced to a drainage ditch. Eielson Air Force Base vacuum dredged and removed most of the upper 18 to 24 inches of soil in the drainage ditch leading into Garrison Slough. Excavation in the drainage ditch extended downward until either groundwater was encountered or field screening results indicated PCB concentrations of less than 10 milligrams per kilogram. A 180-foot section of Garrison Slough was not excavated because an unexploded ordnance was discovered. PCBs at concentrations above DEC cleanup levels are known to remain in the slough sediments. Fish tissue sampling has also occurred. A risk assessment was performed to set maximum contamination levels allowable in fish. As a temporary measure engineering controls were initiated to prevent fish from entering the slough. An additional munitions sweep was conducted in spring 2007 and ensured no other unexploded ordnances existed. Some sediment profiling was conducted in spring 2007, and 2008 and a "Dredge and Cap" removal action is being planned. In the 5-year ROD review, completed in 2008, ADEC and EPA recommended additional actions to address the contamination. The planned remedial action is a high priority for FFY2011. Long term monitoring will consist of sediment sampling and fish tissue analysis. The TMDL was finalized on September 27, 1996, and the waterbody was moved to Category 4a in 1998. The TMDL analysis showed that the remedial actions would result in attaining WQS.</p>								

## A. Waterbody Categories 2 through 5

## Category 4a Waterbodies

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Category 4a Waterbodies – TMDL has been completed, impaired water.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
IN	Category 4a	40506-003	Noyes Slough	Fairbanks	7 miles	Residues	Debris	Urban Runoff
Noyes Slough was placed on the 1994 Section 303(d) list for debris. A TMDL was developed and finalized for the debris residue in May 2008. Noyes Slough remains on the Section 303(d) list of impaired waters for petroleum hydrocarbons and sediment.								
SC	Category 4a	30102-604	Akutan Harbor	Akutan Island	N/A	Residues Dissolved Gas	Settleable Solids Low Dissolved Oxygen	Seafood Processing/ Waste
Akutan Harbor was originally on the 1994 Section 303(d) list for residues and dissolved gas. EPA issued a TMDL for Akutan Harbor on February 12, 1995. EPA finalized the associated NPDES permit for this area in spring 1996. The waterbody was removed from the Section 303(d) list in 1998 and remains in Category 4a. The seafood processing facility located in Akutan Harbor is currently under a consent decree that requires a 12% reduction in 5-day biochemical oxygen demand (BOD5) in addition to the limitations in the NPDES permit. The associated revised NPDES permit has discharge limits consistent with a TMDL.								
SC	Category 4a	20401-004	Campbell Creek	Anchorage	10 miles	Fecal Coliform Bacteria	Fecal Coliform Bacteria	Urban Runoff
Campbell Creek was placed on the Section 303(d) list in 1990 for non-attainment of the FC bacteria standard. The Campbell Creek water quality assessment completed in June 1994 investigated several parameters of concern, including temperature, turbidity, zinc, and lead, but concluded that Campbell Creek was water quality limited for FC bacteria only. Water quality sampling was conducted in 2005. A TMDL was developed for FC bacteria and was approved by EPA on June 15, 2006.								
SC	Category 4a	20401-402	Campbell Lake	Anchorage	125 acres	Fecal Coliform Bacteria	Fecal Coliform Bacteria	Urban Runoff
Campbell Lake was placed on the Section 303(d) list in 1990 for non-attainment of the FC bacteria standard. The Campbell Creek water quality assessment, completed in June 1994, included an assessment of Campbell Lake. The assessment investigated several parameters of concern, including FC bacteria, lead, and zinc, but concluded that Campbell Lake was water quality limited only for FC bacteria. Water quality sampling was conducted in 2005. A TMDL was developed for FC bacteria and was approved by EPA on June 15, 2006.								
SC	Category 4a	20401-003	Chester Creek	Anchorage	4.1 miles	Fecal Coliform Bacteria	Fecal Coliform Bacteria	Urban Runoff, Industrial
Chester Creek was placed on the Section 303(d) list in 1990 for non-attainment of the FC bacteria standard. In April 1993, a water quality assessment was completed on the Chester Creek drainage. Although the assessment identified several parameters of concern for Chester Creek, it was concluded that the waterbody is water quality limited only for FC bacteria. A TMDL for FC bacteria was developed and approved by EPA (dated May 2005).								

A. Waterbody Categories 2 through 5

## Category 4a Waterbodies

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**Category 4a Waterbodies** – TMDL has been completed, impaired water.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SC	Category 4a	20402-002	Eagle River	Eagle River	N/A	Toxic & Other Deleterious Organic and Inorganic Substances	Ammonia, Chlorine, Copper, Lead, Silver	Wastewater Treatment Facility
Although Eagle River was never Section 303(d) listed, a TMDL for the waterbody for ammonia and metals was completed by EPA on April 12, 1995, to support the NPDES permit for the wastewater treatment facility that discharges to the river.								
SC	Category 4a	20401-005	Fish Creek	Anchorage	6.4 miles	Fecal Coliform Bacteria	Fecal Coliform Bacteria	Urban Runoff
Fish Creek has been on the Section 303(d) list since 1990 for non-attainment of the FC bacteria standard and the turbidity standard. A 1995 waterbody assessment concluded Fish Creek was impaired only for FC bacteria. A TMDL for FC bacteria was developed and approved by EPA in March 2004.								
SC	Category 4a	20401-006	Furrow Creek	Anchorage	5.3 miles	Fecal Coliform Bacteria	Fecal Coliform Bacteria	Urban Runoff
This waterbody was placed on the 1990 Section 303(d) list for non-attainment of the FC bacteria standard. Water quality monitoring data from the Municipality of Anchorage show that the levels of FC bacteria exceed the designated use criteria for drinking water, primary contact recreation, and occasionally for secondary contact recreation. The source of the FC bacteria is presumed to be human-caused from urban runoff sources. A TMDL for FC bacteria was developed and was approved by EPA in March 2004.								
SC	Category 4a	30101-501	King Cove	King Cove	N/A	Residues	Seafood Waste Residue	Seafood Processing/ Waste
King Cove was originally on the 1996 Section 303(d) list for residues. On October 10, 1998, EPA completed a TMDL for King Cove. The water was removed from the Section 303(d) list in 1998. The original listing was based on historical information provided by the Aleutians East Borough and verified by DEC staff. The information included citizen complaints and photographs as well as other indications that persistent exceedances of seafood residues were from seafood processing activity adjacent to the waterbody. The water remains in Category 4a since a TMDL was developed in 1998.								

## A. Waterbody Categories 2 through 5

## Category 4a Waterbodies

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<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SC	Category 4a	20505-409	Lake Lucille	Wasilla	N/A	Dissolved Gas	Low Dissolved Oxygen	Urban Runoff
This waterbody was Section 303(d) listed for dissolved gas (low DO) and nutrients in 1994. A TMDL for Lake Lucille was completed and was approved by EPA (March 2002). The waterbody was removed from the Section 303(d) list in 2002/2003. Priority actions for this water include completion of the development of a TMDL implementation plan, continuation of education on nonpoint source pollution controls, and work with a technical team to determine a water quality sampling plan to monitor nutrients and DO levels. Water quality data collected by DEC in 2004, 2005, and 2006 indicate DO levels have been within Alaska WQS ranges during open water seasons, but below WQS ranges during times of ice cover.								
SC	Category 4a	20401-017	Little Campbell Creek	Anchorage	8.3 miles	Fecal Coliform Bacteria	Fecal Coliform Bacteria	Urban Runoff
Little Campbell Creek was Section 303(d) listed in 1990 for non-attainment of the FC bacteria standard. The water quality assessment for the Campbell Creek Drainage indicates that Little Campbell Creek is impaired only for FC bacteria. A TMDL for FC bacteria was developed and was approved by EPA in March 2004.								
SC	Category 4a	20401-024	Little Rabbit Creek	Anchorage	6.2 miles	Fecal Coliform Bacteria	Fecal Coliform Bacteria	Urban Runoff
Little Rabbit Creek was placed on the 1994 Section 303(d) list for non-attainment of the FC bacteria standard. A TMDL for FC bacteria was developed and was approved by EPA in March 2004.								
SC	Category 4a	20401-018	Little Survival Creek	Anchorage	3.0 miles	Fecal Coliform Bacteria	Fecal Coliform Bacteria	Urban Runoff
Little Survival Creek was placed on the 1994 Section 303(d) list for non-attainment of the FC bacteria standard. The source of the FC bacteria exceedances has been identified as caused by both human and non-human sources, such as wildlife. A TMDL for FC bacteria was developed and was approved by EPA in March 2004.								
SC	Category 4a	20401-020	Ship Creek Glenn Hwy. Bridge. Down to Mouth	Anchorage	Glenn Hwy. Bridge. Down to Mouth	Fecal Coliform Bacteria	Fecal Coliform Bacteria	Urban Runoff
A TMDL for the FC bacteria impairment on Ship Creek was developed and approved by EPA in March 2004. Ship Creek remains Category 5/Section 303(d) listed from a petroleum product impairment.								

## A. Waterbody Categories 2 through 5

## Category 4a Waterbodies

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Category 4a Waterbodies – TMDL has been completed, impaired water.

Region	Category	Alaska ID Number	Waterbody	Location	Area of Concern	Water Quality Standard	Pollutant Parameters	Pollutant Sources
SC	Category 4a	30102-603	South Unalaska Bay	Unalaska Island	N/A	Residues, Low Dissolved Oxygen	Seafood Waste Residues, Dissolved Gas	Seafood Processing Waste
This waterbody was on the 1994 Section 303(d) list for both settleable solids and DO. EPA issued the TMDLs on February 12, 1995, and revised seafood processing permits to implement TMDL controls. The water was removed from the Section 303(d) list in 1996. Seafood processors discharging into South Unalaska Bay have been implementing TMDL controls. South Unalaska Bay discharge permits are tracked and monitored by DEC and/or EPA to ensure that waterbody recovery continues, and the seafood processors are fully implementing their revised permit requirements.								
SC	Category 4a	30102-607	Udagak Bay	Unalaska Island	N/A	Residues	Settleable Solids	Seafood Processing Waste
This waterbody was listed on the Section 303(d) list for seafood waste (settleable solids) in 1994. A nearshore floating pollock processor has discharged seafood waste into Udagak Bay. Because of the poor flushing action in Udagak Bay, two piles of fish waste have accumulated at the bottom of the bay. The accumulations resulted in a violation of the WQS because the seafood general NPDES permit issued in 1989 did not provide for a ZOD. Enforcement action has been taken against the same seafood processors for waste that had accumulated on the shoreline and for floating solids on the receiving water. One floating seafood processor is discharging to this water body. The seafood waste residues (waste pile) are decreasing because of better utilization of the fish product. A TMDL was completed for Udagak Bay on September 30, 1998, and the waterbody was removed from the Section 303(d) list in 1998.								
SC	Category 4a	20401-419	University Lake	Anchorage	10 acres	Fecal Coliform Bacteria	Fecal Coliform Bacteria	Urban Runoff
University Lake has been on the Section 303(d) list since 1990 for non-attainment of the FC bacteria standard. The Chester Creek Drainage Water Quality Assessment, focusing on an area that included University Lake, was completed in April 1993. It determined that the waterbody was impaired only for FC bacteria. A TMDL for FC bacteria was developed and was approved by EPA (dated May 2005).								
SC	Category 4a	20401-421	Westchester Lagoon	Anchorage	30 acres	Fecal Coliform Bacteria	Fecal Coliform Bacteria	Urban Runoff
Westchester Lagoon was Section 303(d) listed in 1990 for non-attainment of the FC bacteria standard. The Chester Creek Drainage Water Quality Assessment (which also included Westchester Lagoon), from April 1993, indicated Westchester Lagoon was impaired only for FC bacteria. A TMDL for FC bacteria was developed and was approved by EPA (dated May 2005).								

A. Waterbody Categories 2 through 5

### Category 4a Waterbodies

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**Category 4a Waterbodies** – TMDL has been completed, impaired water.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SE	Category 4a	10301-005	Duck Creek	Juneau	N/A	<b>Dissolved Gas, Residues, Toxic &amp; Other Deleterious Organic and Inorganic Substances, Fecal Coliform Bacteria, Turbidity</b>	<b>Low Dissolved Oxygen, Debris, Iron, Fecal Coliform Bacteria, Turbidity</b>	<b>Urban Runoff, Landfill, Road Runoff, Land Development</b>

Duck Creek was Section 303(d) listed for dissolved gas (low DO), residues (debris), metals, FC bacteria, and turbidity in 1994. TMDLs were completed for all pollutants (turbidity in 1999, FC bacteria and residues in 2000, and DO and iron in 2001), and Duck Creek was removed from the Section 303(d) list and placed in Category 4a in 2002/2003. Priority actions identified for this water include implementing the Duck Creek Management Plan and actions to address loadings identified in TMDLs; conducting monitoring program to determine whether recovery actions are improving water quality; maintaining stream flow to provide fish rearing habitat in the stream, dilute pollutants, and prevent salt water intrusion; and working with the City and Borough of Juneau and others to ensure adequate stormwater permitting practices and controls are implemented to restore water quality. According to the 2007 final monitoring report, Duck Creek continued to suffer from low in-stream flow, except for during large precipitation events; DO levels continued to regularly fall below state standards for aquatic life; pH values were centered near and at times below the state water quality standard of 6.5 for aquatic life, at least during the morning sampling events conducted for this study (variations in pH are expected based on time of day and amount of sunlight); and large amounts of iron floc were noted at all sites. Stream cleanup events are typically conducted on a biennial basis to address ongoing residues (debris) issues in high-density corridors. The construction of wetland habitat and channelization of the stream above Nancy Street have produced some improvement to fish and wildlife habitat, reduced turbidity and iron levels, and raised pH and DO in the downstream reach. However, ongoing land use, ordinance enforcement, and snow disposal on private lands adjacent to Duck Creek continue to impair water quality.

## A. Waterbody Categories 2 through 5

## Category 4a Waterbodies

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Category 4a Waterbodies – TMDL has been completed, impaired water.

Region	Category	Alaska ID Number	Waterbody	Location	Area of Concern	Water Quality Standard	Pollutant Parameters	Pollutant Sources
SE	Category 4a	10203-005	Granite Creek	Sitka	N/A	Turbidity, Sediment	Turbidity, Sediment	Gravel Mining
Granite Creek was placed on the 1996 Section 303(d) list for turbidity and sediment. Information showed that the lower 1.5-mile section of the creek is impaired from sediment and turbidity. Since a TMDL was completed for Granite Creek and approved by EPA (September 30 2002), the waterbody was removed from the Section 303(d) list and moved to Category 4a in 2002/2003. Priority actions for this water include implementing actions identified in the <i>Granite Creek TMDL Watershed Recovery Strategy and Action Plan</i> (March 2002). Granite Creek has been monitored for turbidity and total suspended solids (TSS) as part of the TMDL Implementation Plan through ACWA grants since 2001. The turbidity in Granite Creek has improved significantly since BMP controls at the gravel mining operations have been implemented. Practices have included establishing and enforcing a stream setback, recontouring the road and creating vegetated ditches, and stopping operations if a certain amount of rain falls in a set time period. The City and Borough of Sitka is ensuring that new developments in the area to make sure it is in compliance with the TMDL.								
SE	Category 4a	10203-603	Herring Cove of Silver Bay	Sitka	102 acres	Residues	Bark & Woody Debris	Log Storage from former Pulp Mill Operations
The Herring Cove segment of Silver Bay has been Section 303(d) listed since 1994. On September 27, 1999, a TMDL was completed for residues for this segment of Silver Bay. The Herring Cove segment of Silver Bay was removed from the Section 303(d) list in 2002/2003.								
SE	Category 4a	10301-004	Jordan Creek	Juneau	3 miles from tide-water upstream	Residues	Debris	Land Development, Road Runoff
A TMDL was developed and approved by EPA for residues on Jordan Creek and is dated May 2005. Since a TMDL was developed and approved for residues Jordan Creek was removed from the Section 303(d) and moved to Category 4a for residues. A TMDL for sediment and dissolved gas was completed in 2009. Jordan Creek is being moved to Category 4a in 2010.								

## A. Waterbody Categories 2 through 5

## Category 4a Waterbodies

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Category 4a Waterbodies – TMDL has been completed, impaired water.

Region	Category	Alaska ID Number	Waterbody	Location	Area of Concern	Water Quality Standard	Pollutant Parameters	Pollutant Sources
SE	Category 4a	10301-004	Jordan Creek	Juneau	3 miles from tide-water upstream	Sediment, Dissolved Gas	Sediment, Low Dissolved Oxygen	Land Development, Road Runoff
<p>A TMDL was developed and approved by EPA for residues on Jordan Creek and is dated May 2005. A second TMDL was developed and approved by EPA for dissolved gas and sediment in October 2009. Since a TMDL was developed and approved for residues, dissolved gas, and sediment, Jordan Creek was removed from the Section 303(d) and moved to Category 4a for residues. Populations of coho salmon have dropped from an average of 250 adult returns to 54 in 1996 and 18 in 1997. Jordan Creek had been one of the most productive small streams in Juneau and Southeast Alaska for coho salmon, but has experienced a rapid decline. There are serious sediment problems in the stream, leading to poor survival of salmon eggs and low oxygen readings in the substrate that are in violation of WQS. The stream is largely spring fed and cannot transport large volumes of sediment like the higher gradient systems can. The headwaters of the stream are manipulated with ditches replacing more productive habitat and ponds that have been filled in. More recent observations note a problem with iron floc that was not present 10 years ago; however, no hard iron data that might document iron exceedances are available. The stream corridor is under rapid development, and the lower section of the creek regularly goes dry. Macroinvertebrate bioassessment sampling shows the stream has low diversity and experienced declines during the 1994 to 1996 period. A suite of water quality parameters and pollutants, including sediment, pH, DO, and turbidity, were sampled between November 2007 and June 2008. Findings are summarized in the report <i>Watershed Protection and Recovery for Jordan Creek, Juneau, Alaska</i> (Nagorski, Hood, Hoferkamp, Neal &amp; Hudson, July 2008). Biennial "Slash the Trash" cleanup events occur and two sStormwater BMP demonstration sites were installed in 2009 in areas adjacent to the stream to provide information and education to the general public.</p>								
SE	Category 4a	10203-602	Klag Bay	West Chichagof Island	1.25 acres	Toxic & Other Deleterious Organic and Inorganic Substances	Metals – Arsenic, Cobalt, Copper, Lead, Manganese, Mercury, Silver, Zinc	Mining
<p>Klag Bay was placed on the 1996 Section 303(d) list for non-attainment of the toxic and other deleterious organic and inorganic substances standard for metals. Past mining resulted in the deposition of large amounts of tailings in Klag Bay. A draft 1985 report (never finalized) on Klag Bay, the <i>Klag Bay Study</i>, was prepared by USF&amp;WS and indicated high levels of metals from tailings are leaching into the bay. Contaminants are mercury, arsenic, cobalt, copper, lead, and silver. These metals caused abnormalities in numerous blue mussels. These abnormalities are considered an impairment of a designated use. A preliminary assessment/site investigation (PA/SI) (Ecology &amp; Environment Inc. 1999) and Preliminary Draft Report (Klag Bay waterbody Assessment, Cadmus Group Inc. and CDM, 2008) confirmed lead, silver, arsenic, and mercury in the intertidal sediments above NOAA screening benchmarks. A TMDL was developed and approved by EPA on June 1, 2009, for the metals impairments.</p>								

## A. Waterbody Categories 2 through 5

## Category 4a Waterbodies

Alaska's 2010

Integrated Water Quality Monitoring and Assessment Report

Category 4a Waterbodies – TMDL has been completed, impaired water.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SE	Category 4a	10301-001	Lemon Creek	Juneau	N/A	Turbidity, Sediment	Turbidity, Sediment	Urban Runoff, Gravel Mining
This waterbody was placed on the 1990 Section 303(d) list for turbidity, sediment, and concerns about habitat modification. A waterbody recovery plan that included a TMDL was prepared and approved for this waterbody in fall 1995, and Lemon Creek was removed from the Section 303(d) list in 1996. Waterbody recovery plan implementation began during fall 1995. The University of Alaska Southeast conducted a sediment assessment. This assessment defined concentrations of natural nonpoint source sediment within Lemon Creek, where active glacial processes contribute to sediment problems. A paired watershed study was conducted from May 2002 through June 2003 to ascertain the roles of glacier processes on watershed sediment discharge. This study concluded that in systems substantially influenced by glacier and mass wasting processes, the traditional TSS-Q (total suspended sediment-stream discharge) relationship is not particularly meaningful because some of the most pronounced sediment events are associated with processes that are not well correlated with stream discharge. Results of this project will also assist with flood control and bank stabilization projects proposed for Lemon Creek. Priority actions for this water include implementing control actions and monitoring as recommended in the TMDL document.								
SE	Category 4a	10301-014	Pederson Hill Creek	Juneau	Lower two miles	Fecal Coliform Bacteria	Fecal Coliform Bacteria	Septic Tanks
Pederson Hill Creek was Section 303(d) listed in 1990 for non-attainment of the FC bacteria standard from certain areas of failing onsite septic systems. FC bacteria contamination had been well documented since 1985, with values as high as 2400 FC/100 ml reported in 1991. Monitoring conducted from November 2005 through summer 2006 found that FC bacteria levels continue to exceed WQS at least on some sites during parts of the year. A final TMDL for FC bacteria was completed for Pederson Hill Creek (dated February 2009).								
SE	Category 4a	10303-004	Pullen Creek (Lower Mile)	Skagway	Lower mile of Pullen Creek	Toxic & Other Deleterious Organic and Inorganic Substances	Metals – Barium, Lead, Zinc	Industrial
Pullen Creek has been on the Section 303(d) list since 1990 for non-attainment of the toxic and other deleterious organic and inorganic substances standard for metals. The lower mile of Pullen Creek was previously Section 303(d) listed with the Skagway Harbor listing, but was segmented out into its own listing in the 2006 report. A local nonprofit group completed an environmental assessment on the creek, collecting baseline monitoring data on water quality, flow, and sedimentation and developed an action strategy for Pullen Creek in 2006. Assessment results found no elevated levels of toxics in the water column. Elevated levels of lead, zinc, and barium have been found in stream bottom sediments and adjoining banks. Stream banks, are very stable but elevated levels of metals are found near railroad transport areas where ore was transported in the past. A waterbody recovery plan with BMPs was completed in 2006, and major riparian restoration projects were completed in summer 2009. A TMDL was developed in May 2010 and Pullen Creek was removed from the Section 303(d) list and placed in Category 4a.								

A. Waterbody Categories 2 through 5

Category 4a Waterbodies

**Alaska's 2010**  
Integrated Water Quality Monitoring and Assessment Report  
**Category 4a Waterbodies** – TMDL has been completed, impaired water.

Region	Category	Alaska ID Number	Waterbody	Location	Area of Concern	Water Quality Standard	Pollutant Parameters	Pollutant Sources
SE	Category 4a	10203-601	Silver Bay	Sitka	6.5 acres	Residues, Toxic & Other Deleterious Organic and Inorganic Substances	Pulp Residues, Logs, Bark & Woody Debris, Sediment Toxicity due to Wood Decomposition By-products	Industrial, Historical Pulp Mill Activity
<p>Silver Bay was Section 303(d) listed in 1994 for non-attainment of residues, toxic and other deleterious organic and inorganic substances, and dissolved gas standards for sludge (residues), toxic substances, and dissolved gas (DO). A report titled <i>Final Expanded Site Inspection Report, Alaska Pulp Corporation, Sitka, Alaska</i>, prepared in February 1995, substantiated water quality exceedances. Discharges from the mill ceased in March 1993. Based on a DEC June 1993 Water Quality Assessment, the pollutant parameters of concern were sludge and DO. A contaminated site Remedial Investigation/Feasibility Study for Silver Bay was contracted by Alaska Pulp Company from July 1996 to February 1999. DEC issued a Record of Decision ROD in 1999. The remedial action objective identified by the ROD was natural recovery, with long-term monitoring. A TMDL was developed for Silver Bay in 2003, with waste load allocations for residues and sediment toxicity. Monitoring data show that Silver Bay is no longer impaired for DO. Although DO levels below the limits of the WQS have been observed in deep water between Sawmill Cove and Herring Cove, no correlation between these levels and the presence of wood waste has been identified, and no current source of DO depression is known. Therefore, the DO pollutant parameter was removed from the Silver Bay listing, and no TMDL will be developed for DO. In 1999, a TMDL was completed for residues for the Herring Cove segment of Silver Bay. A TMDL for residues and sediment toxicity was completed in 2003. Based on the 2003 TMDL, Silver Bay was removed from the Section 303(d) list and placed in Category 4a.</p>								

A. Waterbody Categories 2 through 5

## Category 4a Waterbodies

**Alaska's 2010**

Integrated Water Quality Monitoring and Assessment Report

**Category 4a Waterbodies** – TMDL has been completed, impaired water.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SE	Category 4a	10103-602	Thorne Bay	Prince of Wales Island	7.5 acres	Residues	Bark & Wood Debris	Historical Log Transfer Facility
<p>The Thorne Bay historical marine LTF, which consisted of both a nearshore log transfer area and an associated LSA, was Section 303(d) listed in 1994 for non-attainment of the residues standard for bark and wood debris. Log transfer and storage activities began in 1962 and caused the accumulation of woody debris on the bottom of the head of Thorne Bay. Log transfer and storage activities ended in 2000, and the operator, USFS, does not plan to resume them; all equipment and facilities have been removed. A key feature of the recovery of the former log transfer and storage area is the Thorne River, which empties into the bay and deposits sediments onto a large sand and gravel delta, where they mix with debris and aid in biological recovery. The Log Storage Area: Dive surveys of the LSA conducted in July 2001 and June 2002 documented 1.1 acres of bark and wood debris on the marine bottom. Dive surveys in 2003 and 2005 detailed the benthic health of 161 acres of the former LSA. Findings included the following: (1) bark debris was mostly decomposed to small fragments and was mixed with natural sediments; (2) the bottom was biologically recovered, exhibiting mostly mature “Stage III” biological communities; and (3) the site was an “extremely healthy coastal embayment.” DEC determined, based on the detailed benthic assessment, that the residues standard is met in the former LSA. DEC removed the LSA from the Section 303(d) list and placed it in Category 2 in 2004. The LSA remains in Category 2 with no known impairments. The Log Transfer Facility: Dive surveys conducted in 1988 and 1990 documented approximately 55 acres of bark accumulation in the LTF. Dive surveys of the LTF conducted in July 2001 and June 2002 documented 2.6 and 1.1 acres of bark and wood debris, respectively, on the marine bottom. An April 2004 dive survey of the LTF documented 6.5 acres of bark and woody debris. The former LTF remained on the Section 303(d) list for a defined area of approximately 35 acres between the LTF shoreline and the boundary of the former LSA established in the 2003-2005 benthic assessment. A December 2007 dive survey documented a reduced area of impaired marine bottom of only 7.5 acres and the rest of the previous area of impairment as meeting the residues criterion and attaining WQS. These findings suggest that biological recovery is proceeding and is well advanced within the area associated with the LTF. A residues TMDL for the Thorne Bay LTF was completed and approved by EPA on May 8, 2007. With the completed TMDL for residues, the LTF was removed from the Section 303(d) list and placed in Category 4a.</p>								
SE	Category 4a	10301-017	Vanderbilt Creek	Juneau	N/A	Turbidity Residues Sediment	Turbidity, Debris, Sediment	Urban Runoff
<p>This waterbody was placed on the 1990 Section 303(d) list for turbidity, debris, sediment, and with concerns for habitat modification. Available file information is insufficient file to correlate habitat modification with effects to designated uses. A waterbody recovery plan that included a TMDL was prepared during summer 1995. EPA approved the TMDL on September 27, 1995, and Vanderbilt Creek was removed from the Section 303(d) list in 1996. Implementation of the waterbody recovery plan began during fall 1995. A local nonprofit group secured state fiscal year 2009 grant funds to remove debris from Vanderbilt Creek using a youth group. The project will also improve public education and stream stewardship through promotion and implementation of a Stream Cleanup Day. Priority actions for this water include implementing control actions and monitoring as recommended in the TMDL document. The Juneau Watershed Partnership received ACWA grant funds to evaluate actions and update the recovery plan, develop a water quality monitoring strategy, and conduct a stream cleanup.</p>								

A. Waterbody Categories 2 through 5

## Category 4a Waterbodies

Alaska's 2010

Integrated Water Quality Monitoring and Assessment Report

**Category 4a Waterbodies** – TMDL has been completed, impaired water.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SE	Category 4a	10102-601	Ward Cove	Ketchikan	250 acres	Residues Dissolved Gas	Pulp Residues, Logs, Bark & Woody Debris, Low Dissolved Oxygen	Industrial

Ward Cove has been Section 303(d) listed since 1990. The waterbody was listed for non-attainment of the residues and dissolved gas standards from pulp residues, logs, bark and woody debris, and low DO from historical discharges and associated activity from the Ketchikan Pulp Company pulp mill operations. The pulp mill wastewater discharges ceased in 1997 and consequently color was removed from the listing. Studies indicated that bottom sediments and accumulations of wood debris contribute to seasonal depressions in DO in Ward Cove. Discharge monitoring reports that were required by timber processing discharge permits from 1995 to 2000 showed severe DO depressions at certain times and locations during stratification of the waterbody in late summer and fall. The deeper layer of water more than 5 to 10 meters was below Alaska water quality criteria for DO. These findings provided evidence of an ongoing DO deficit in Ward Cove. The seafood processing facility, which had contributed to DO depressions, has ceased discharging and no new sources or residues from this source are present. A surface DO TMDL for Ward Cove was issued by EPA on May 5, 1994, while the pulp mill was still discharging. Since discharges ceased in 1997 surface water DO has been meeting WQS, Ward Cove has remained Category 5/Section 303(d) listed for non-attainment of the dissolved gas standard for DO below the pycnocline (at depth, i.e., for deeper waters). In 2006 the toxicity in Ward Cove was more closely reviewed and more accurately described as “sediment toxicity” from pulp residues, logs, and bark and woody debris operations. An 80-acre area of concern was removed from the Section 303(d) listing for sediment toxicity and placed in Category 4b because DEC and EPA have determined that the approved and final ROD of the Superfund cleanup for the “Ketchikan Pulp Company, Marine Operable Unit, Ketchikan, Alaska” (March 29, 2000) are adequate “other pollution controls” for sediment toxicity in Ward Cove. The Superfund cleanup actions subsequently proved effective, and the area that had been previously impaired from sediment toxicity was moved to Category 2. A TMDL for residues and DO was developed and approved by EPA on May 15, 2007. Consequently, Ward Cove has been placed in Category 4a for residues and dissolved gas (DO).

A. Waterbody Categories 2 through 5

## Category 4b Waterbodies

Alaska's 2010

Integrated Water Quality Monitoring and Assessment Report

**Category 4b Waterbodies** – Impaired but not needing a TMDL; expected to meet standards in a reasonable time period.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
IN	Category 4b	40501-001	Cabin Creek	Nabesna	1.5 miles	<b>Toxic &amp; Other Deleterious Organic and Inorganic Substances</b>	<b>Manganese, Arsenic, Iron, Copper &amp; Cadmium</b>	<b>Mining</b>
<p>Cabin Creek is located on park lands within Wrangell-St. Elias National Park and Preserve. This waterbody was Section 303(d) listed in 1996 for manganese from the Nabesna Mine Site - a patented mining claim area located on private property within the legislative boundary of Wrangell St. Elias National Preserve. The U.S. Geological Survey and National Park Service completed a field sampling component of an environmental geochemical site characterization study at the Nabesna Mine in 1997 (results published in USGS PP 1619). National Park Service and DEC staff visited the Site and waterbody in June 1997 to discuss specifics of a waterbody recovery plan with the owner of the Nabesna Mine property. Acidic mill tailings located down slope of the mill building (situated on both private and National Park Service-managed lands), may be compromising the water quality of Cabin Creek. Elevated metal levels were detected periodically in the Cabin Creek drainage within the one mile reach below the mill tailings.. In 2002/2003 arsenic, iron, copper and cadmium were added to the 1996 Section 303(d) listing. Recovery plan objectives include re-construction of the existing historic drainage ditches around the tailings to divert stormwater and seasonal snow melt run-off away from (bypass) the tailings. The NPS implemented a surface water flow mitigation plan in 2004 and re-directed surface water flows away from the tailings to minimize introduction of metals into Cabin Creek. Visual observations by the NPS indicate that the water flow mitigation work has intercepted 80% of the water that previously flowed across the tailings. Water quality monitoring was conducted during spring run-off in May 2007. The volume of water flowing across the tailings was substantially diminished, which resulted in lower volumes of water carrying dissolved metals. Additional water quality sampling was conducted in 2009 and will be used, among other things, to validate the effectiveness of the on-the-ground- controls. Cabin Creek meets the Category 4b criteria and was removed from Category 5 (Section 303(d) list) in 2004. A Category 4b rationale has been developed and on record and available upon request. NPS is utilizing the CERCLA process to respond to the release of hazardous substances at the Nabesna Mine Site. This response consists of performing a non-time critical removal action (NTCRA). A NTCRA requires the development of an Engineering Evaluation/Cost Evaluation (EE/CA). Through this process, current Site conditions and existing data will be duly considered in furthering the removal action selection process. The selected removal action will address unacceptable human health and ecological risks associated with Site contaminants.</p>								

A. Waterbody Categories 2 through 5

## Category 4b Waterbodies

Alaska's 2010

Integrated Water Quality Monitoring and Assessment Report

**Category 4b Waterbodies** – Impaired but not needing a TMDL; expected to meet standards in a reasonable time period.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SC	<b>Category 4b</b>	N/A	<b>Exxon Valdez Beaches</b>	<b>Prince William Sound -Alaska Peninsula</b>	<b>23 beaches</b>	<b>Petroleum Hydrocarbons, Oils &amp; Grease</b>	<b>Petroleum Products</b>	<b>Exxon Valdez Crude Oil Spill</b>
<p>Exxon Valdez Beaches were Section 303(d) listed as impaired in 1990. The 23 Exxon Valdez affected beaches and adjacent marine waters were later placed in Category 4b because it was believed that a TMDL process would be redundant to the efforts of the Exxon Valdez Trustee Council (EVOSTC) and restoration projects specified in the Exxon Valdez Restoration Plan. In 2007, the EVOSTC funded a pair of projects to identify the areas where oil is most likely to persist and factors responsible for the in situ degradation of oil. The project, <i>Assessment of the Areal Distribution and Amount of Lingering Oil in Prince William Sound and the Gulf of Alaska</i> (conducted by Michel et al, 2007.), will produce maps showing the probability of lingering oil. A draft final report for this project has been submitted to the EVOSTC but has not been published at the time of this report. The second project, <i>Factors Responsible for Limiting the Degradation Rate of Exxon Valdez Oil in Prince William Sound Beaches</i> (conducted by Boufadel et al, 2007), found persistent oil in anoxic sediments with low permeability and identified the main factors limiting biodegradation as oxygen and nitrogen to a much lesser extent. The study recommends pilot studies of in situ remedial efforts involving surface injection of oxygen and nutrients to accelerate biodegradation. The results of this project have been published in Nature Geoscience; however, a final report will not be available through EVOSTC until summer 2010. This combination of work will assist DEC in more clearly identifying the nature and extent of impairment that still occurs and help to ensure the EVOSTC targets remedial efforts to effectively work toward meeting WQS. A Category 4b rationale has been developed; it is on record and available upon request. The Exxon Valdez beaches have been placed in Category 4b.</p>								
SE	<b>Category 4b</b>	<b>10203-808</b>	<b>East Port Frederick</b>	<b>NE Chichagof Island</b>	<b>0.4 acres</b>	<b>Residues</b>	<b>Bark &amp; Woody Debris</b>	<b>Log Transfer Facility</b>
<p>East Port Frederick was Section 303(d) listed for non-attainment of the residues standard for bark and woody debris. Dive survey information documents a significant exceedance of the bark accumulation level for the interim intertidal threshold (according to the <i>ATTF Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines</i>, October 21, 1985). The operator submitted a remediation plan, which DEC approved on March 14, 2005. The approved remediation plan contains adequate institutional controls to minimize future accumulation of bark and wood waste on the bottom and is expected to result in reducing continuous cover to less than 1.5 acres within a reasonable period of time. EPA approved removing East Port Frederick from the Section 303(d) list as part of Alaska's 2004 Integrated Report. A March 4 to 6, 2008, bark monitoring survey report documented 1.74 acres of continuous bark debris. A March 24 to 26, 2009, bark monitoring survey documented in the survey report a reduction in bark debris to 1.31 acres of continuous bark debris. A Category 4b rationale has been developed; it is on record and available upon request.</p>								

A. Waterbody Categories 2 through 5

## Category 4b Waterbodies

Alaska's 2010

Integrated Water Quality Monitoring and Assessment Report

**Category 4b Waterbodies** – Impaired but not needing a TMDL; expected to meet standards in a reasonable time period.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SE	<b>Category 4b</b>	10103-031	<b>Fubar Creek</b>	<b>Prince of Wales Island</b>	N/A	<b>Sediment</b>	<b>Sediment</b>	<b>Timber Harvest</b>
<p>In 1993, the Fubar Creek watershed, located on federal National Forest lands, experienced multiple landslides during heavy rain. This erosion, which resulted from the impacts of timber harvests in previous years, added more sediment to the creek than could be washed downstream. This large influx of sediment negatively affected the ability of the creek to sustain anadromous fish populations. The waterbody was placed in Category 4b in 1996. No significant commercial harvest activity has occurred within the watershed since the USFS deferred the timber harvest in 1995, and the Fubar Creek watershed was not considered for entry during the next planning cycle for 10-year timber sales. A comprehensive hydrologic condition assessment of the Harris River Basin was completed in 2003. It included a road condition survey that identified 1.2 miles of old logging road that were placed in storage in 2006. Channel condition monitoring was conducted for a number of years in Fubar Creek. Monitoring assessed trends in geomorphic indicators to determine progress toward channel equilibrium. The watershed-based assessment and the channel condition monitoring helped to guide and prioritize restoration activities in the Fubar Creek subwatershed. The Craig Ranger District has actively restored vegetation to stabilize landslide areas and the modified the structure and function of riparian timber stands to prevent further sediment input. In 2006 and 2007, USFS restored about 5,500 feet of creek by removing large quantities of sediment from the creek bed, reconstructing the channel, and reestablishing large wood jams and pools to enhance anadromous fish habitat and spawning. Completion of the 2006 work allowed the first perennial flows under the highway bridge in the 13 years since the 1993 landslides. The last phase of active restoration was replacement of the floodplain overflow culverts on the Hydaburg Highway in summer 2008. Monitoring of restoration efforts to restore the anadromous fish habitat included measurement of pool and channel morphology, smolt counts, and observations of adult spawning activity in the restored channel. A summary of the restoration effort and monitoring results was published in 2008. A Category 4b rationale has been developed; it is on record and available upon request.</p>								

A. Waterbody Categories 2 through 5

### Category 5/Section 303(d) Listed Waterbodies

Alaska's 2010

Integrated Water Quality Monitoring and Assessment Report

Category 5 Waterbodies – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
<b>IN</b>	<b>Category 5 Section 303(d) Listed</b>	<b>40506-007</b>	<b>Chena River</b>	<b>Fairbanks</b>	<b>15 miles</b>	<b>Sediment</b>	<b>Sediment</b>	<b>Urban Runoff</b>
Chena River was Section 303(d) listed in 1990 for turbidity, petroleum hydrocarbons and oils and grease and for sediment. The identified pollutant source is urban runoff. DEC conducted sampling in 2005, 2007, and 2009 for hydrocarbons and sediment. Data have shown that the Chena River met WQS for the petroleum hydrocarbon standard. Data are currently being reviewed for the sediment standard, and Chena River remains Section 303(d) listed for sediment.								
<b>IN</b>	<b>Category 5 Section 303(d) Listed</b>	<b>40506-002</b>	<b>Chena Slough</b>	<b>Fairbanks</b>	<b>13 miles</b>	<b>Sediment</b>	<b>Sediment</b>	<b>Urban Runoff</b>
Chena Slough was Section 303(d) listed in 1994 for non-attainment of the petroleum hydrocarbons and oils and grease and of sediment standards. Information presented in the 1994 Statewide Water Quality Assessment survey indicated that a petroleum problem existed and is affecting water quality. File assessment information indicates nonpoint source problems result from the surface water runoff, road construction, site clearing, and dewatering activities from gravel operations. Based on best professional judgment of DEC staff, this water was listed for petroleum products. DEC conducted water quality testing in 2005, 2007, and 2009. Data have shown that the Chena Slough met WQS for the petroleum hydrocarbon standard. Data are currently being reviewed for the sediment standard and Chena Slough remains Section 303(d) listed for sediment.								

A. Waterbody Categories 2 through 5

**Category 5/Section 303(d) Listed Waterbodies**

Alaska's 2010

Integrated Water Quality Monitoring and Assessment Report

**Category 5 Waterbodies** – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
IN	Category 5 Section 303(d) Listed	40402-010	Crooked Creek Watershed: Bonanza Creek Crooked Creek Deadwood Creek Ketchem Creek Mammoth Creek Mastodon Creek Porcupine Creek	North of Fairbanks	77 miles	Turbidity	Turbidity	Placer Mining
<p>Crooked Creek watershed was Section 303(d) listed in 1992 for non-attainment of the turbidity standards. A water quality assessment was completed in August 1995. Monitoring conducted in the early 1990s documented major improvements in water quality. The assessment called for the development of a waterbody recovery plan to restore and maintain habitat quality; however, this plan has not been developed. DEC is currently preparing a monitoring and sampling plan for use in 2011 and 2012. The monitoring results will provide current data that will determine whether a TMDL is needed for these waters.</p>								
IN	Category 5 Section 303(d) Listed	40509-001	Goldstream Creek	Fairbanks	70 miles	Turbidity	Turbidity	Placer Mining
<p>Goldstream Creek was Section 303(d) listed in 1992 for non-attainment of the turbidity standard. A waterbody assessment was completed and confirmed the pollutant and pollutant source. The assessment determined that existing controls were sufficient to address the turbidity issue and that a formal TMDL was not needed. Nevertheless, the water quality assessment was prepared (September 30, 1994) and submitted to EPA for technical review for Goldstream Creek. The assessment contains a section on development of a management plan and a pollution control strategy. No further sampling has been conducted on this waterbody since the 1996 Section 303(d) listing. Continued monitoring is needed to ensure that existing controls are making progress toward attaining WQS. A monitoring and sampling plan was prepared in 2009 and will be implemented in 2010.</p>								

## A. Waterbody Categories 2 through 5

## Category 5/Section 303(d) Listed Waterbodies

Alaska's 2010

Integrated Water Quality Monitoring and Assessment Report

Category 5 Waterbodies – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
IN	Category 5 Section 303(d) Listed	30501-002	Kuskokwim River	Red Devil	1,000 feet, 900 downriver and 100 feet upriver from the mouth of Red Devil Creek	Toxic & Other Deleterious Organic and Inorganic Substances	Metals – Antimony, Arsenic, Mercury	Mining
Kuskokwim River is placed on the Section 303(d) list of impaired waters in 2010 for non-attainment of the toxic and other deleterious organic and inorganic substances standard for antimony, arsenic, and mercury. Sampling and data collected in 1971, 1979, 1988, and 1999 have documented exceedances for the metals antimony, arsenic, and mercury. The Red Devil mine site that is causing this impairment is under consideration for the Superfund National Priorities List.								
IN	Category 5 Section 303(d) Listed	40506-003	Noyes Slough	Fairbanks	7 miles	Sediment, Petroleum Hydrocarbons, Oil & Grease Residues	Sediment, Petroleum Products	Urban Runoff
Noyes Slough has been on the Section 303(d) list for non-attainment of the sediment, petroleum hydrocarbons and oils and grease, and residues standards for sediment, petroleum products, and debris since 1994. Numerous water quality violations have been reported. These violations are a result of debris dumped into the slough. DEC completed a debris assessment in 2007. Data from the assessment were used to complete a TMDL for residues in 2008. Water quality data collected in 2005, 2007, and 2009 determined a TMDL is necessary for the oils and grease and hydrocarbon impairments. Data are being reviewed for the sediment standard impairment.								
IN	Category 5 Section 303(d) Listed	30501-003	Red Devil Creek	Red Devil	0.5 mile of creek	Toxic & Other Deleterious Organic and Inorganic Substances	Metals – Antimony, Arsenic, Mercury	Inactive Mine
Red Devil Creek is placed on the Section 303(d) list of impaired waters in 2010 for non-attainment of the toxic and other deleterious organic and inorganic substances standard for antimony, arsenic, and mercury. Sampling and data collected in 1971, 1979, 1988, and 1999 have documented exceedances for the metals antimony, arsenic, and mercury. The Red Devil mine site that is causing this impairment is under consideration for the Superfund National Priorities List.								

A. Waterbody Categories 2 through 5

**Category 5/Section 303(d) Listed Waterbodies**

Alaska's 2010

Integrated Water Quality Monitoring and Assessment Report

**Category 5 Waterbodies** – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
IN	<b>Category 5 Section 303(d) Listed</b>	40510-003	Slate Creek	Denali National Park	2.5 miles	Turbidity	Turbidity	Mining
<p>Slate Creek was Section 303(d) listed in 1994 for non-attainment of the turbidity water quality standard because of placer mining activities. No active mining is on Slate Creek is occurring, and current National Park Service (NPS) policy will not permit future placer mining. A recovery plan implementation began in August 1997 and continued through 2002. The recovery plan included restoration objectives for 4 acres of disturbed upland and stream channel areas in the vicinity of the old antimony mine site. Objectives included placement of fill over exposed antimony ore body, reconfiguration of the stream channel, increases in the pH of acidic soils, and revegetation of disturbed soils with willow and alder seedlings. Slate Creek was visited by DEC staff and NPS staff in 2006 for a general site review of the recovery plan implementation that was completed in 2002. The 2006 site visit revealed that the recovery plan was not successful and that in many areas actions implemented were no longer performing their functions properly. NPS staff visited Slate Creek twice in the 2007 field season to gather information to develop an amended recovery concept plan. The amended plans have been developed to address the surface and groundwater drainage for erosion control and acidic mitigation. If funding becomes available, work will begin in 2010.</p>								
SC	<b>Category 5 Section 303(d) Listed</b>	20505-401	Big Lake	Wasilla	1,250 acres	Petroleum Hydrocarbons	Total Aromatic Hydrocarbons	Motorized Watercraft
<p>Big Lake was Section 303(d) listed in 2006 for non-attainment of the petroleum hydrocarbons (TAH) water quality standard. DEC collected water quality information at Big Lake in the open water months in 2004, 2005 and 2009. Petroleum hydrocarbon (TAH) sampling was conducted in the water column at multiple sites, depths, and degrees of motorized watercraft activity throughout the lake. Sampling sites in areas that received heavier use by motorized watercraft consistently exceeded the WQS for TAH and the concentrations are likely influenced by a combination of good weather and time of season. The sample events that coincided with the higher mean air temperatures are likely also prime recreational dates based on the increased motorized watercraft usage at these times. Specifically, the areas of impairment together equal an estimated 1,250 acres and are seasonal in nature, from May 15 to September 15 with particular impairment issues on two holiday weekends (Memorial Day and Independence Day). The following specific areas in the east basin are the areas of impairment: harbors and marinas, launch areas, and traffic lanes. Sampling was conducted outside these specific areas and exceedances were not identified. Two reports support the impairment listing: <i>Big Lake and Lake Lucille Water Quality Monitoring Final Report</i> (September 2, 2004) and <i>Big Lake Water Quality Monitoring Report</i> (June 15, 2006), both prepared by Oasis Environmental, Inc., for DEC. A third report, <i>Water Quality Monitoring, Big Lake</i> (January 2009) is currently being finalized by Oasis Environmental for DEC. Although no water quality samples were collected below 5 meters, it is considered unlikely that petroleum contaminated sediment is a concern. The source of petroleum is motorized watercraft. Management measures will focus on reducing petroleum hydrocarbon inputs at harbors and marinas, launch areas, and traffic lanes of the east basin on busy holiday weekends.</p>								

A. Waterbody Categories 2 through 5

**Category 5/Section 303(d) Listed Waterbodies**

Alaska's 2010

Integrated Water Quality Monitoring and Assessment Report

**Category 5 Waterbodies** – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SC	<b>Category 5 Section 303(d) Listed</b>	<b>30101-500</b>	<b>Cold Bay</b>	<b>King Cove, Alaska Peninsula</b>	<b>0.01 acre</b>	<b>Petroleum Hydrocarbons, Oils &amp; Grease</b>	<b>Petroleum Products</b>	<b>Military, Fuel Storage</b>
<p>Cold Bay was placed on the 1998 Section 303(d) list for non-attainment of the petroleum hydrocarbons, oils and grease standard for petroleum products. Enough evidence exists to indicate that water quality violations occurred on a persistent (though intermittent) basis. Because the cleanup of petroleum contaminated soils at the Cold Bay formally used defense site is considered a high-priority project, USACE completed an assessment and recovery plan. A release investigation of the seep at the foot of the high sea bluff found high levels of DRO in beach soils (more than 10,000 parts per million) and petroleum contamination in sediments below the high tide line. Four feet of free product was found in a monitoring well in the bluff. The seep weeps a mixture of petroleum and water intermittently along 100 to 300 feet of bluff. In the summer of 2002, USACE used a pilot test to evaluate several passive and active technologies for recovering product before it would reach the waters of Cold Bay. The results of this test were used to develop a feasibility study to determine the best solution for the beach seeps. The feasibility study was completed in 2003. In accordance with the Record of Decision document the USACE agreed to dig and treat petroleum contaminated soil to 15 feet. Contaminated soil below 15 feet will undergo in situ treatment. Soil excavation and treatment were conducted in 2006. For the drum disposal and beach seep area, a two-phased approach was selected. In summer 2006, soil 15 feet below ground surface and above was excavated and thermally treated. In 2007, USACE installed bioventing, soil vapor extraction (SVE) and high vacuum extraction (HVE) wells to continue remediating the area. The amount of contamination discharging to the beach decreased markedly. DEC's Contaminated Sites Program reports that the petroleum sheen is getting smaller every time inspections are made on site. The Contaminated Sites receives monthly reports showing the amount of free product recovered and petroleum product degraded as a result of the SVE and HVE systems in operation. In July 2009, the USACE reassessed the petroleum seep at the foot of the beach bluff. They found the longitudinal area of the seep has reduced by two-thirds since it was last evaluated in 2007.</p>								
SC	<b>Category 5 Section 303(d) Listed</b>	<b>20505-001</b>	<b>Cottonwood Creek</b>	<b>Wasilla</b>	<b>7 miles</b>	<b>Fecal Coliform Bacteria</b>	<b>Fecal Coliform Bacteria</b>	<b>Urban Runoff, Urban Development</b>
<p>Cottonwood Creek (13 miles) was Section 303(d) listed for non-attainment of the residues standard for foam and debris in 2002/2003. DEC has received numerous complaints about foam in Cottonwood Creek and foam was observed in the creek in 1998, 2000, 2001, and 2002. Through grant funds, an intensive water quality evaluation was conducted on Cottonwood Creek beginning in September 2004 and continuing through June 2006 for a TMDL assessment. Water quality sampling conducted in 2004 and 2005 indicated that the foam present in Cottonwood Creek is most likely naturally occurring. However, hydrologic changes within the watershed may be influencing the amount and timing of the foam. Continued water quality sampling in 2006 focused on determining the extent of FC bacteria and temperature exceedances discovered during the sampling for foam, as well as further investigation of the foam. Foam and temperature were determined to be naturally occurring hence meeting WQS. FC bacteria exceeded WQS, and the source(s) is unknown. Cottonwood Creek is now in Category 2 for attainment of the residues (foam) standard and impaired for FC bacteria.</p>								

A. Waterbody Categories 2 through 5

**Category 5/Section 303(d) Listed Waterbodies**

Alaska's 2010

Integrated Water Quality Monitoring and Assessment Report

**Category 5 Waterbodies** – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SC	<b>Category 5 Section 303(d) Listed</b>	<b>30401- 601</b>	<b>Dutch Harbor</b>	<b>Unalaska Island</b>	<b>0.5 acre</b>	<b>Petroleum Hydrocarbons, Oils &amp; Grease</b>	<b>Petroleum Products</b>	<b>Industrial, Urban Runoff</b>
<p>Dutch Harbor was Section 303(d) listed in 1994 for non-attainment of the petroleum hydrocarbons oils and grease standard for petroleum products. An EPA study in August 1994, <i>Water Quality Assessment for Greater Unalaska Bay</i>, concluded the waterbody was affected by petroleum products. TMDL assessment began in 2006. An existing data compilation was completed, and potential risk sources were identified and assigned priorities. Rigorous field sampling events were conducted in April 2007, September 2007, and September 2008 and included water column and sediment samples for BTEX, PAH, and TOC. Results indicate the water column meets WQS, but several sediment results had surface sheening in exceedance of the standard. The area of impairment has been further refined and reduced as a result of the field sampling and includes two nearshore areas. The area of the harbor that has been found to meet the petroleum hydrocarbons standard has been moved to Category 2. The TMDL for the remaining impaired areas is scheduled for completion by June 30, 2010. Implementation will focus on dock and harbor BMPs to minimize any new petroleum hydrocarbon inputs to the area.</p>								
SC	<b>Category 5 Section 303(d) Listed</b>	<b>30203- 001</b>	<b>Egegik River</b>	<b>Egegik</b>	<b>0.25 mile</b>	<b>Petroleum Hydrocarbons, Oil &amp; Grease</b>	<b>Petroleum Products</b>	<b>Spills, Fuel Tanks, Under-ground Fuel Tanks</b>
<p>This waterbody was Section 303(d) listed for non-attainment of the petroleum hydrocarbons oils and grease standard for petroleum products in 2002/2003. Contamination from at least three major sources has migrated into the groundwater and through soils into the Egegik River: the former locations of two 10,000 gallon gasoline tanks, an unlined diesel tank farm, and the underground threaded-coupling pipeline from the tank farm on the bluff that leaked gasoline in April 2001. The area used to house fuel tanks and was filled from a barge in the river. Extensive contamination is suspected. Site characterization of the entire site has not been completed. It is believed that the old fuel tanks were in place and active from the 1960s through the 1990s and continue to be a problem. The river inundates the soils behind the seawall (which are contaminated) regularly when the tide comes up. The monthly high tides usually breach the seawall and flood the area. Fuel from the April 2001 gasoline spill reaches the water continuously. It appears that the groundwaters are hydrologically connected to the river and that the fuels will continue to migrate to the river. Photographic documentation shows petroleum daylighting into the river and sheen on the water. The problem is likely to remain chronic unless the contaminated soils are excavated and free product recovery is completed.</p>								

A. Waterbody Categories 2 through 5

**Category 5/Section 303(d) Listed Waterbodies**

Alaska's 2010

Integrated Water Quality Monitoring and Assessment Report

**Category 5 Waterbodies** – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SC	<b>Category 5 Section 303(d) Listed</b>	20201-401	<b>Eyak Lake</b>	<b>Cordova</b>	<b>50 feet of shore-line</b>	<b>Petroleum Hydrocarbons, Oils &amp; Grease</b>	<b>Petroleum Products, Petroleum Contamination, Sheen</b>	<b>Above Ground Storage Tanks, Spills</b>
<p>Eyak Lake was placed on the 2002/2003 Section 303(d) list for non-attainment of the petroleum hydrocarbons oils and grease standard for petroleum products. Remedial actions at the Cordova Electric Power Plant on Eyak Lake, including a groundwater pump-and-treat system and passive product collection, have been effective at eliminating sheen on the surface of the lake, which was last observed in 2005. Groundwater treatment and monitoring is anticipated to continue at this site in the future. In 2005 and 2006, two water quality studies were completed on the lake. Although these studies showed the lake meeting standards, local residents expressed other petroleum-related concerns. Additional evaluation was warranted, and a study ,started in 2009 is expected to be completed in 2010. When data collection is complete, a determination about whether a TMDL is required will be made.</p>								
SC	<b>Category 5 Section 303(d) Listed</b>	20401-412	<b>Hood/Spenard Lake</b>	<b>Anchorage</b>	<b>307 acres</b>	<b>Dissolved Gas</b>	<b>Low Dissolved Oxygen</b>	<b>Urban Runoff, Industrial</b>
<p>Hood/Spenard Lake was originally Section 303(d) listed in 1990 and in1992 for non-attainment of the FC bacteria standard and in 2002/2003 for low DO. The waterbody was also placed on the 1992 Section 303(d) list for FC bacteria, lead, nitrates, and phosphates. A TMDL was developed for FC bacteria in 1997, and the waterbody remained on the Section 303(d) list (Category 5) for dissolved gas (i.e., low DO). A later DEC water quality assessment also assessed the four other pollutants of concern: petroleum, nitrates, lead, and ammonia. However, the data indicated that there are no persistent violations of these parameters. Priority actions identified for this water include Ted Stevens Anchorage International Airport (TSAIA) shunting away much of the stormwater from the tarmac and installation of retention ponds to treat stormwater coming from the parking lots; future construction to improve drainage in the area; tracking of ongoing stormwater rerouting projects and water quality sampling being done by TSAIA; and conducting monitoring of nutrients and stormwater BMP effectiveness. TSAIA submitted and DEC approved a waterbody recovery plan for Hood/Spenard Lake. The recovery plan has three components: (1) a reduction in the amount and placement of urea, (2) an increase in glycol recovery, and (3) diversion of stormwater contaminated by glycol and nutrientsstormwater from the waterbody. Review of water quality data from 2000 to 2009 shows that the waters are meeting the FC bacteria standard and Hood/Spenard Lake is in Category 2 for meeting the FC bacteria standard.</p>								

A. Waterbody Categories 2 through 5

**Category 5/Section 303(d) Listed Waterbodies**

Alaska's 2010

Integrated Water Quality Monitoring and Assessment Report

**Category 5 Waterbodies** – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed.

Region	Category	Alaska ID Number	Waterbody	Location	Area of Concern	Water Quality Standard	Pollutant Parameters	Pollutant Sources
SC	<b>Category 5 Section 303(d) Listed</b>	<b>30102-602</b>	<b>Iliuliuk Harbor</b>	<b>Unalaska Island</b>		<b>Petroleum Hydrocarbons, Oils &amp; Grease</b>	<b>Petroleum Products</b>	<b>Urban Runoff</b>
<p>Iliuliuk Harbor was Section 303(d) listed in 1990 for non-attainment of the petroleum hydrocarbons oils and grease standard for petroleum products. An EPA study in August 1994, <i>Water Quality Assessment for Greater Unalaska Bay</i>, concluded the waterbody was affected by petroleum products. TMDL assessment began in 2006. An existing data compilation was completed, and potential risk sources were identified and assigned priorities. Rigorous field sampling events were conducted in April 2007, September 2007, and September 2008 and included water column and sediment samples for BTEX, PAH, and TOC. Results indicate the water column meets WQS, but several sediment results had surface sheening in exceedance of the standard. The area of impairment has been further refined and reduced as a result of the field sampling and includes nearshore areas around docks and harbors. The TMDL is scheduled for completion by June 30, 2010. Implementation will focus on dock and harbor BMPs to minimize any new petroleum hydrocarbon inputs to the area.</p>								
SC	<b>Category 5 Section 303(d) Listed</b>	<b>20402-001</b>	<b>Matanuska River</b>	<b>Palmer</b>	<b>½ mile</b>	<b>Residues</b>	<b>Debris</b>	<b>Landfill</b>
<p>This segment of the Matanuska River was placed on the 2002/2003 Section 303(d) list for non-attainment of the residues standard for debris. An active open dump is located on and in the Matanuska River just north of Eagle Drive in Palmer. Numerous derailed railroad cars are visible in the river and riparian area. The main site of concern is the active dump. Visible contents of the dump at the time of the inspection were a minimum of 20 vehicles, household refuse and items, fuel cans, possible 55-gallon drums with unknown contents, grass cuttings, and scrap metal and other debris. Debris continues in the river and riparian area upstream for approximately 1/2 mile. River channels run through and next to the dump at all times of the year. Visible sheens have been observed in the river. This open dump is not only an immediate threat to the surface water quality of the Matanuska River, but is within the Drinking Water Protection Area for a minimum of three public water systems. In August 2004, DEC conducted a site assessment study. Activities included characterizing and quantifying the debris, mapping the site, and conducting surface water, sediment, and soil samples. No hazardous or petroleum contamination was discovered. After characterizing the debris, options were developed for possible debris removal as part of the study. Following subsequent meetings with involved parties, in March 2005 USACE issued a jurisdictional declaration that the railroad cars that are below ordinary high water serve as bank stabilization material. As such, these items are no longer in violation of WQS. However, the remaining debris on the slope above ordinary high water has a potential of entering the water column, and the upper layers are not considered bank stabilization material. The Alaska Railroad Corporation, as the property owner, needs to work with DEC Solid Waste staff on developing a plan with goals and a timeline delineating its commitment to cleaning up the site.</p>								

A. Waterbody Categories 2 through 5

**Category 5/Section 303(d) Listed Waterbodies**

Alaska's 2010

Integrated Water Quality Monitoring and Assessment Report

**Category 5 Waterbodies** – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SC	<b>Category 5 Section 303(d) Listed</b>	<b>30101-502</b>	<b>Popof Strait</b>	<b>East Aleutians Borough</b>	<b>5 miles</b>	<b>Residues</b>	<b>Seafood Waste Residue</b>	<b>Seafood Processor</b>
<p>Popof Strait was Section 303(d) listed in 1996 for non-attainment of the residues standard from seafood waste residues. Information provided by the Aleutians East Borough, and verified by DEC staff, included citizen complaints, photographs, and other indications that persistent exceedances of “seafood residue” occur from a seafood processor operating adjacent to the waterbody. The seafood processing facility located in Sand Point has installed a fish meal plant that reduces the discharge of solid wastes to Popof Strait. The company is currently under a consent decree for BOD<sub>5</sub> covering this facility (as well as the one in Akutan) where there is a BOD<sub>5</sub> limit for the Sand Point facility. An April 2000 dive survey report documented 3.0 acres of residues in excess of the permitted facility’s authorized 1-acre ZOD. No more recent dive survey information is available.</p>								
SC	<b>Category 5 Section 303(d) Listed</b>	<b>30102-409</b>	<b>Red Lake Anton Road Ponds</b>	<b>Kodiak</b>	<b>2.0 acres</b>	<b>Toxic &amp; Other Deleterious Organic and Inorganic Substances</b>	<b>Metals - Iron, Manganese</b>	<b>Urban Runoff</b>
<p>Red Lake Anton Road Ponds were placed on the 1994 Section 303(d) list for non-attainment of the toxic and other deleterious organic and inorganic substances standard for metal. Based on a 1992 memorandum released by DEC Kodiak Field Office, Red Lake lies less than 200 feet from a Navy landfill. This landfill was constructed without a liner or leachate collection system. Landfill waste, which may include solvents, paints, used oils, and contaminated fuel, occasionally leaches into Red Lake and two other small ponds near Anton Road. These two ponds are highly colored by bright orange-red iron precipitates caused by the oxidation of the leachate. Lake sediment samples were found to contain 8.6% iron. Chemical pollutants were documented at low levels in the lake and in the bottom sediments. DEC staff reviewed four reports from 1996 and 1997. The data presented in the reports are the best available. DEC concluded that (1) Red Lake clearly appears to have exceedances of WQS for iron and manganese because of human actions; (2) no existing controls are in place to ensure that the WQS will be met in a reasonable time period; (3) because the reports did not present any information showing levels of iron and manganese in groundwater above the landfill, no information shows that the abandoned landfill is not the source of these metals; and (4) although there were other parameters of concern observed in previous sampling, the available information indicates that Red Lake should only be listed for manganese and iron.</p>								

A. Waterbody Categories 2 through 5

**Category 5/Section 303(d) Listed Waterbodies**

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**Category 5 Waterbodies** – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SC	<b>Category 5 Section 303(d) Listed</b>	<b>20401-020</b>	<b>Ship Creek Glenn Hwy. Bridge. Down to Mouth</b>	<b>Anchorage</b>	<b>11 miles, Glenn Hwy. Bridge. Down to Mouth</b>	<b>Petroleum Hydrocarbons, Oils &amp; Grease</b>	<b>Petroleum Products</b>	<b>Urban Runoff</b>
<p>This segment of Ship Creek was Section 303(d) listed in 1990 for non-attainment of the petroleum hydrocarbons and oils and grease standard. Based on the FC bacteria monitoring data from 1989 to 1994 provided by the Municipality of Anchorage, the water quality criteria for drinking water and contact recreation were exceeded at various times. Petroleum products floating on groundwater are moving from the site toward Ship Creek and threaten the waterbody. In 1992, FC bacteria was added to the Section 303(d) listing as an impairing pollutant. The final FC bacteria TMDL was approved by EPA in May 2004. Ship Creek remains Section 303(d) listed for petroleum product impairment. EPA currently has a consent decree with the Alaska Railroad Corporation which involves water quality monitoring for petroleum. The results of the monitoring program will assist DEC in determining the next best recovery actions for Ship Creek, including the possible development of a TMDL or similar recovery plan. Sampling was conducted in 2005 and 2006 as part of the consent decree.</p>								
SE	<b>Category 5 Section 303(d) Listed</b>	<b>10203-002</b>	<b>Katlan River</b>	<b>N. of Sitka, Baranof Island</b>	<b>4.5 miles</b>	<b>Sediment, Turbidity</b>	<b>Sediment, Turbidity</b>	<b>Timber Harvest</b>
<p>Katlan River was Section 303(d) listed as impaired in 1998 for non-attainment of the sediment and turbidity standards. Past land use activities have created a number of concerns about water quality, and fish habitat. The harvest of riparian timber and location and lack of maintenance of the road system created the following concerns: decreased channel stability, landslides and small slope failures, increased sediment levels, loss of aquatic habitat, siltation of holding pools for migrating salmon, and alteration of watershed hydrology. Watershed effects resulted in use impairment for aquatic life. USFS (in cooperation with EPA and DEC) is considering conducting in-depth turbidity monitoring and aquatic habitat condition assessments to determine the validity of the impaired water body listing for this watershed. If the assessment indicates that the water body was erroneously listed, the water body will be moved to Category 2. If water quality or habitat impairments are identified in the assessment, restoration plans to establish pollution control requirements will be developed.</p>								

## A. Waterbody Categories 2 through 5

## Category 5/Section 303(d) Listed Waterbodies

Alaska's 2010

Integrated Water Quality Monitoring and Assessment Report

Category 5 Waterbodies – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SE	Category 5 Section 303(d) Listed	10103-504	Salt Chuck Bay	Kasaan Area, Prince of Wales Island	0.03 square miles	Toxic & Other Deleterious Organic and Inorganic Substances	Metals - Copper	Mining
Salt Chuck Bay is Section 303(d) listed in 2010 for non-attainment of the toxic and other deleterious organic and inorganic substances standard for metals. The Salt Chuck Mine was listed on the Federal Agency Hazardous Waste Compliance Docket and published in the <i>Federal Register</i> on June 27, 1997, because studies indicated physical and chemical hazardous to the public and environment. At the request of USFS, URS Engineering initiated an Engineering Evaluation/Cost Analysis of the site in 2002 and conducted additional data collection and investigation in 2006. On September 23, 2009, the Salt Chuck Mine was proposed for addition to the EPA National Priorities List. Copper concentrations found in the intertidal water column exceed state WQS. In addition sediment/tailings found in the intertidal zone exceed state guidelines for sediment quality.								
SE	Category 5 Section 303(d) Listed	10303-601	Skagway Harbor	Skagway	1.0 acre	Toxic & Other Deleterious Organic and Inorganic Substances	Metals - Cadmium, Copper, Lead, Mercury, Zinc	Industrial
Skagway Harbor has been on the Section 303(d) list since 1990 for non-attainment of the toxic and other deleterious organic and inorganic substances standard for metals. A 1984 draft report from USF&WS titled Trace Metals Contamination at an Ore Loading Facility in Skagway, Alaska, indicated that trace metals contamination is due to an ore loading facility in Skagway. Elevated levels of lead, zinc, cadmium, copper, and mercury in marine sediments were found to exceed DEC (SPAR) values of the control area. Additionally, in fauna found in the marine sediments were much reduced and a reduction in fauna and biodiversity was correlated with concentrations of lead and zinc in marine sediment. These effects are considered to be an impairment to the designated use: aquatic life. Additional sampling in 2008 found metals in the marine sediment to be below recommended action levels and petroleum constituents above action levels. A TMDL is being prepared to address the impairment.								

A. Waterbody Categories 2 through 5

**Category 5/Section 303(d) Listed Waterbodies**

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**Category 5 Waterbodies** – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SE	Category 5 Section 303(d) Listed	10103-010	Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3027 (Stream 3)	Prince of Wales Island	0.4 mile	Toxic & Other Deleterious Organic and Inorganic Substances	Metals - Aluminum, Cadmium, Copper, Iron	Road Construction
Stream 3 was placed on the 2010 list for Section 303(d) list for non-attainment of the toxic & other deleterious organic and inorganic substances standard for metals. Studies adopted by the Alaska Department of Environmental Conservation (ADEC) and the Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA) indicate high levels of metals leaching into the stream as a result of acid rock drainage from road construction. Contaminants exceeding WQS and the NOAA screening benchmarks include aluminum, cadmium, copper, and iron. These exceedances are considered an impairment of a designated use.								
SE	Category 5 Section 303(d) listed	10103-012	Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3021 (Stream 6)	Prince of Wales Island	1.14 mile	Toxic & Other Deleterious Organic and Inorganic Substances, Dissolved Inorganic Substances	Metals – Aluminum, Cadmium, Copper, Iron, Manganese, Sulfate	Road Construction
Stream 6 was placed on the 2010 list for Section 303(d) list for non-attainment of the toxic & other deleterious organic and inorganic substances standard for metals. Studies adopted by the Alaska Department of Environmental Conservation (ADEC) and the Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA) indicate high levels of metals leaching into the stream as a result of acid rock drainage from road construction. Contaminants WQS and the NOAA screening benchmarks include aluminum, cadmium, copper, iron, and manganese. Sulfate is included in the list of contaminates for this waterbody. These exceedances are considered an impairment of a designated use.								

A. Waterbody Categories 2 through 5

**Category 5/Section 303(d) Listed Waterbodies**

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Integrated Water Quality Monitoring and Assessment Report

**Category 5 Waterbodies** – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SE	Category 5 Section 303(d) listed	10103-013	Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3019 tributary (Stream 7)	Prince of Wales Island	0.3 mile	Toxic & Other Deleterious Organic and Inorganic Substances	Metals - Aluminum, Cadmium, Copper, Iron, Manganese	Road Construction
Stream 7 was placed on the 2010 list for Section 303(d) list for non-attainment of the toxic & other deleterious organic and inorganic substances standard for metals. Studies adopted by the Alaska Department of Environmental Conservation (ADEC) and the Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA) indicate high levels of metals leaching into the stream as a result of acid rock drainage from road construction. Contaminants WQS and the NOAA screening benchmarks include aluminum, cadmium, copper, iron, and manganese. These exceedances are considered an impairment of a designated use.								
SE	Category 5 Section 303(d) listed	10103-014	Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3019 (Stream 8)	Prince of Wales Island	0.3 mile	Toxic & Other Deleterious Organic and Inorganic Substances	Metals - Cadmium, Copper, Iron, Manganese, Nickel, Zinc	Road Construction
Stream 8 was placed on the 2010 list for Section 303(d) list for non-attainment of the toxic & other deleterious organic and inorganic substances standard for metals. Studies adopted by the Alaska Department of Environmental Conservation (ADEC) and the Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA) indicate high levels of metals leaching into the stream as a result of acid rock drainage from road construction. Contaminants WQS and the NOAA screening benchmarks include cadmium, copper, iron, manganese, nickel, and zinc. These exceedances are considered an impairment of a designated use.								

A. Waterbody Categories 2 through 5

**Category 5/Section 303(d) Listed Waterbodies**

Alaska's 2010

Integrated Water Quality Monitoring and Assessment Report

**Category 5 Waterbodies** – Impaired by pollutant(s) for one or more designated uses and requiring a TMDL. CWA Section 303(d) Listed.

<i>Region</i>	<i>Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SE	Category 5 Section 303(d) listed	10103-015	Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3017 tributary (Stream 9)	Prince of Wales Island	0.8 mile	Toxic & Other Deleterious Organic and Inorganic Substances, Dissolved Inorganic Substances	Metals- Aluminum, Cadmium, Copper, Iron, Manganese, Nickel, Zinc, Sulfate	Road Construction
<p>Stream 9 was placed on the 2010 list for Section 303(d) list for non-attainment of the toxic &amp; other deleterious organic and inorganic substances standard for metals. Studies adopted by the Alaska Department of Environmental Conservation (ADEC) and the Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA) indicate high levels of metals leaching into the stream as a result of acid rock drainage from road construction. Contaminants WQS and the NOAA screening benchmarks include aluminum, cadmium, copper, iron, manganese, nickel, and zinc. Sulfate is included in the list of contaminants present on this waterbody. These exceedances are considered an impairment of a designated use.</p>								

B. Waterbodies Removed From the Section 303(d) List

# APPENDIX B Waterbodies Removed From the Section 303(d) List

## Section 303(d) Listed Waterbodies in 2008 Removed from the List in 2010

Alaska's 2010  
Integrated Water Quality Monitoring and Assessment Report  
Section 303(d) Listed Waterbodies in 2008. Removed from the List in 2010.

<i>Region</i>	<i>New Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
IN	Category 2	40510-005	Caribou Creek	Denali National Park	16.1 miles	Turbidity	Turbidity	Mining
<b>REASON FOR REMOVAL: No impairment exists from turbidity; waterbody is attaining water quality standards.</b>								
Caribou Creek was included on the 1994 Section 303(d) list for turbidity from past mining activity within Denali National Park and Preserve. The waterbody lost its sinuosity along segments of the watershed. Currently there is no active mining on Caribou Creek and current National Park Service (NPS) policy will not permit future placer mining. A site visit with NPS, EPA, and DEC was conducted in 2009 to review the progress of previous reclamation efforts and to assess any areas requiring additional reclamation activities. NPS established seven cross sections for floodplain design purposes. Topographic monitoring was conducted before and after the establishment of the seven cross sections. Channel locations and sinuosity were surveyed with a global positioning system (GPS), and water discharge was measured. Analysis and evaluation of site and data concluded that Caribou creek is meeting the turbidity standard, although further work would be beneficial. Therefore, a draft recovery plan has been prepared to reconstruct the floodplain, rebuild the channel(s), and provide for more natural overbank flooding and deposition. The reconstruction will be followed by a revegetation effort. If funding becomes available, work is to begin in 2010.								
IN	Category 2	40506-007	Chena River	Fairbanks	15 miles	Petroleum Hydrocarbons, Oils & Grease	Petroleum Products	Urban Runoff
<b>REASON FOR REMOVAL: No impairment exists from petroleum hydrocarbons; waterbody is attaining water quality standards.</b>								
Chena River was Section 303(d) listed in 1990 for turbidity, petroleum hydrocarbons oils and grease, and sediment. The identified pollutant source is urban runoff. DEC conducted sampling in 2005, 2007, and 2009 for hydrocarbons and sediment. Data have shown that the Chena River met WQS for the petroleum hydrocarbon standard. Data are currently being reviewed for the sediment standard.								

**B. Waterbodies Removed From the Section 303(d) List**

Alaska's 2010  
Integrated Water Quality Monitoring and Assessment Report  
Section 303(d) Listed Waterbodies in 2008. Removed from the List in 2010.

<i>Region</i>	<i>New Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
<b>IN</b>	<b>Category 2</b>	<b>40506-002</b>	<b>Chena Slough</b>	<b>Fairbanks</b>	<b>13 miles</b>	<b>Petroleum Hydrocarbons, Oils &amp; Grease</b>	<b>Petroleum Products</b>	<b>Urban Runoff</b>
<b>REASON FOR REMOVAL: No impairment exists from petroleum hydrocarbons; waterbody is attaining water quality standards.</b>								
This waterbody was Section 303(d) listed in 1994 for non-attainment of the petroleum hydrocarbons oils and grease standard and the sediment standard. Information presented in the 1994 Statewide Water Quality Assessment survey indicated that a petroleum problem existed and is affecting water quality. File assessment information indicates nonpoint source problems result from the surface water runoff, road construction, site clearing, and dewatering activities from gravel operations. Based on best professional judgment of DEC staff, this water was listed for petroleum products. DEC conducted water quality testing in 2005, 2007, and 2009. Data have shown that the Chena Slough met WQS for the petroleum hydrocarbon standard. Data are currently being reviewed for the sediment standard.								
<b>SC</b>	<b>Category 2</b>	<b>20505-001</b>	<b>Cottonwood Creek</b>	<b>Wasilla</b>	<b>Entire 13 miles</b>	<b>Residues</b>	<b>Foam &amp; Debris</b>	<b>Urban Runoff, Urban Development</b>
<b>REASON FOR REMOVAL: No impairment exists from residues; waterbody is attaining water quality standards.</b>								
Cottonwood Creek (13 miles) was Section 303(d) listed for non-attainment of the residues standard for foam and debris in 2002/2003. DEC has received numerous complaints about foam in Cottonwood Creek, and foam was observed in the creek in 1998, 2000, 2001, and 2002. Foam is a recurring problem, with no existing controls to address it. Through grant funds, an intensive water quality evaluation was conducted on Cottonwood Creek from September 2004 through June 2006 for a TMDL assessment. Water quality sampling conducted in 2004 and 2005 indicated that the foam present in Cottonwood Creek is most likely naturally occurring. However, hydrologic changes within the watershed may be influencing the amount and timing of the foam. Water quality sampling in 2006 focused on determining the extent of FC bacteria and temperature exceedances discovered during the sampling for foam. Additional bacteria and temperature sampling is scheduled for 2007/2008 to determine potential sources and stretches of possible impairment. Data will be used to develop a recovery plan.								

**B. Waterbodies Removed From the Section 303(d) List**

Alaska's 2010  
Integrated Water Quality Monitoring and Assessment Report  
Section 303(d) Listed Waterbodies in 2008. Removed from the List in 2010.

<i>Region</i>	<i>New Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SC	Category 2	30401-601	Dutch Harbor	Unalaska Island	0.5 acre	Petroleum Hydrocarbons, Oils & Grease	Petroleum Products	Industrial, Urban Runoff
<b>REASON FOR REMOVAL: No impairment exists from petroleum hydrocarbons for much of the harbor area; waterbody is attaining water quality standards.</b>								
Dutch Harbor was Section 303(d) listed in 1994 for non-attainment of the petroleum hydrocarbons, oils and grease standard for petroleum products. An EPA study in August 1994, <i>Water Quality Assessment for Greater Unalaska Bay</i> , concluded the waterbody was affected by petroleum products. TMDL assessment began in 2006. An existing data compilation was completed, and potential risk sources were identified and assigned priorities. Rigorous field sampling events were conducted in April 2007, September 2007, and September 2008 and included water column and sediment samples for benzene, toluene, ethylbenzene, and xylenes (BTEX); polycyclic aromatic hydrocarbon (PAH); and total organic carbon (TOC). Results indicate the water column meets WQS but several sediment results had surface sheening in exceedance of the standard. The original area of impairment has been reduced as a result of the field sampling and includes two nearshore impaired areas and some areas of the harbor found to meet WQS. The TMDL for the remaining impaired areas is scheduled for completion by June 30, 2010. Implementation will focus on dock and harbor BMPs to minimize any new petroleum hydrocarbon inputs to the area.								
SC	Category 2	30102-602	Iliuliuk Bay	Dutch Harbor		Petroleum Hydrocarbons, Oils & Grease	Petroleum Products	Urban Runoff
<b>REASON FOR REMOVAL: No impairment exists from petroleum hydrocarbons for much of the bay area; waterbody is attaining water quality standards.</b>								
Iliuliuk Bay was Section 303(d) listed in 1990 for non-attainment of the petroleum hydrocarbons, oils and grease standard for petroleum products. An EPA study in August 1994, <i>Water Quality Assessment for Greater Unalaska Bay</i> , concluded the waterbody was affected by petroleum products. TMDL assessment began in 2006 with completing an existing data compilation and identifying and prioritizing potential risk sources. Rigorous field sampling events were conducted in April 2007 and September 2007 and included water column and sediment samples for BTEX, PAH, and TOC. All sample results for Iliuliuk Bay indicate the water and sediments are meeting standards for petroleum hydrocarbons. DEC is removing Iliuliuk Bay from the Category 5/Section 303(d) list based on these data in 2010.								
SE	Category 4a	10301-004	Jordan Creek	Juneau	3 miles from tide-water upstream	Sediment, Dissolved Gas	Sediment, Low Dissolved Oxygen	Land Development, Road Runoff
<b>REASON FOR REMOVAL: TMDL developed and approved for sediment and dissolved gas (low interstitial DO).</b>								
A TMDL was developed and approved by EPA (May 2005) for residues on Jordan Creek. Because the waterbody has an approved TMDL for residues, Jordan Creek was removed from the Section 303(d) and moved to Category 4a for residues. Also, a TMDL was developed and approved by EPA (October 2009) for dissolved gas and sediment on Jordan Creek.								

**B. Waterbodies Removed From the Section 303(d) List**

Alaska's 2010  
Integrated Water Quality Monitoring and Assessment Report  
Section 303(d) Listed Waterbodies in 2008. Removed from the List in 2010.

<i>Region</i>	<i>New Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SE	Category 4a	10203-602	Klag Bay	West Chichagof Island	1.25 acres	Toxic & Other Deleterious Organic and Inorganic Substances	Metals – Arsenic, cobalt, copper, lead, manganese, mercury, silver, zinc	Mining
<b>REASON FOR REMOVAL: TMDL developed and approved for metals in the intertidal sediments.</b>								
Klag Bay was placed on the 1996 Section 303(d) list for non-attainment of the toxic and other deleterious organic and inorganic substances standard for metals. Past mining resulted in the deposition of large amounts of tailings in Klag Bay. A draft 1985 report (never finalized) on Klag Bay, the <i>Klag Bay Study</i> , was prepared by USF&WS and indicated high levels of metals from tailings are leaching into the bay. Contaminants are mercury, arsenic, cobalt, copper, lead, and silver. These metals caused abnormalities in numerous blue mussels. These abnormalities are considered an impairment of a designated use. A 1998 preliminary assessment confirmed lead, silver, arsenic and mercury in the intertidal sediments above NOAA screening benchmarks. A TMDL was developed and approved by EPA on June 1, 2009, for the metals impairments.								

**B. Waterbodies Removed From the Section 303(d) List**

Alaska's 2010  
Integrated Water Quality Monitoring and Assessment Report  
Section 303(d) Listed Waterbodies in 2008. Removed from the List in 2010.

<i>Region</i>	<i>New Category</i>	<i>Alaska ID Number</i>	<i>Waterbody</i>	<i>Location</i>	<i>Area of Concern</i>	<i>Water Quality Standard</i>	<i>Pollutant Parameters</i>	<i>Pollutant Sources</i>
SE	Category 2	10203-001	Nakwasina River	Baranof Island, Sitka	8 miles	Sediment, Turbidity	Sediment, Turbidity	Timber Harvest
<b>REASON FOR REMOVAL: No impairment exists; waterbody is attaining water quality standards.</b>								
Nakwasina River was placed on the 1998 Section 303(d) list for non-attainment of the sediment and turbidity standards. Past land use activities had created a number of concerns about water quality and fish habitat. The harvest of riparian timber and the location and lack of maintenance of the road system created the following conditions: decreased channel stability, landslides and small slope failures, increased sediment levels, loss of aquatic habitat, siltation of holding pools for migrating salmon, and alteration of watershed hydrology. Watershed effects resulted in use impairment for aquatic life. The U.S. Forest Service (USFS) submitted a 2-year Water Quality and Aquatic Habitat Restoration Assessment in February 2009 and recommended removal from the 303(d) list based on its results. The data demonstrate that turbidity levels have decreased below state WQS. The waterbody was moved to Category 2 in 2010.								
SE	Category 4a	10303-004	Pullen Creek (Lower Mile)	Skagway	Lower mile of Pullen Creek	Toxic & Other Deleterious Organic and Inorganic Substances	Metals – Barium, Lead, Zinc	Industrial
<b>REASON FOR REMOVAL: TMDL developed in May 2010 and approved for metals.</b>								
Pullen Creek has been on the Section 303(d) list since 1990 for non-attainment of the toxic and other deleterious organic and inorganic substances standard for metals. The lower mile of Pullen Creek was previously Section 303(d) listed with the Skagway Harbor listing, but was segmented out into its own listing in the 2006 report. A local nonprofit group completed an environmental assessment on the creek, collecting baseline monitoring data on water quality, flow, and sedimentation and developed an action strategy for Pullen Creek in 2006. Assessment results found no elevated levels of toxics in the water column. Elevated levels of lead, zinc, and barium have been found in stream bottom sediments and adjoining banks. Stream banks, are very stable but elevated levels of metals are found near railroad transport areas where ore was transported in the past. A waterbody recovery plan with BMPs was completed in 2006, and major riparian restoration projects were completed in summer 2009. A TMDL was developed in May 2010 and Pullen Creek was removed from the Section 303(d) list and placed in Category 4a.								

# APPENDIX C TMDL Schedule and Factors

## Alaska TMDL Completion Date Schedule (Revised 10/09)

NOTE: The years shown are from July 1 to June 30. It is expected that for any given year, the TMDL will be completed by June 30 of the year that identifies the row in which the waterbody is shown. During TMDL development, it may be determined that a TMDL is not needed if the waterbody has recovered or adequate restoration actions are ongoing.

Completion Date	Southeast	Southcentral	Interior/North Slope
<b>2010</b>			Chena River
		Dutch Harbor	Chena Slough
		Iliuliuk Harbor	
<b>2011</b>		Big Lake	Noyes Slough (sediment, petroleum hydrocarbons)
	Skagway Harbor		Slate Creek
		Egegik River	Eyak Lake
		Ship Creek (Petroleum)	
		Matanuska River	
<b>2012</b>	Katlian River	Popof Strait	
		Red Lake/Anton Pond	Goldstream Creek
		Hood/Spenard Lake	
		Cold Bay	
<b>2013</b>		Cottonwood Creek	
<b>2014</b>	Salt Chuck Bay		Crooked Creek Watershed
	Coffman Cove Creeks		Kuskokwim River
			Red Devil Creek

## Factors Considered in Alaska's 2010 TMDL Schedule Revision

All Alaska Category 5 Section 303(d) listed waters for the 2010 Integrated Water Quality Monitoring and Assessment Report are scheduled for development of TMDL between 2010 and 2014. Any Section 303(d) listed waters that are impaired from an active log transfer facility (LTF) will be subject to a remediation plan in an enforceable permit to meet the water quality goals of the waterbody. The TMDLs for these waterbodies are scheduled based on DEC's consideration of the factors listed below. These factors are not necessarily listed by priority and may be used in conjunction with one another, combined with other project management decisions, or both.

**C. TMDL Schedule and Factors**

- Severity and persistence of pollutant sources, exceedances of WQS, and/or impacts to the beneficial uses of the waterbody
- Significance of the waterbody in terms of public and resource values
- Degree of public, industry, and agency interest in accomplishing the TMDL so that allocations and required controls or permit limits can be known
- Applicability of existing pollution controls, waterbody recovery plans, and NPDES discharge permits
- Technical feasibility and difficulty of developing the TMDL. Development of some TMDLs requires much more time and resources than for other TMDLs, and agency resources have annual limits of time available for TMDL development. Factors that increase the amount of time include waterbodies with uncommon types of impairments for which model TMDLs are not available; TMDLs that require complex models and loading calculations; and TMDLs on waters with many stakeholders who will be significantly affected by loading allocations.
- Availability and accuracy of water quality information necessary for assessing the water and making loading determinations. TMDLs for which little data are available are scheduled later so that essential data can be acquired.
- Waters where pilot BMPs or other controls are being implemented and monitored. TMDL development on these waters may be delayed so that improved loading allocations can be made based on performance of the controls.
- Likelihood that proposed restoration efforts might occur in a reasonable time period that, if they occur, may make TMDL development unnecessary
- Development of stakeholder plans that may satisfactorily substitute for (or supplement) a waterbody's TMDL. Examples include a contaminated site remediation plan or another agency's assessment and restoration plan. TMDL development may be scheduled to occur shortly after completion of such plans if they will include information that satisfies what is required in the TMDL.
- Development of multiple TMDLs as part of a unified effort. These situations include development of TMDLs that address similar pollutants and approaches, waters in the same watershed or area, same stakeholders, and similar restoration actions.

The paragraphs below describe important terms.

**TMDL**—A total maximum daily load plan is a “pollution budget” designed to restore the health of a waterbody. A TMDL calculates the amount of a specific pollutant that a waterbody can receive and still maintain Alaska's WQS.

**TMDL loading allocation**—A loading allocation is the amount of a pollutant allowed at any particular time as part of a TMDL plan for waterbody recovery.

***C. TMDL Schedule and Factors***

NPDES Permits or APDES limits—National Pollutant Discharge Elimination System permit limits and Alaska Pollutant Discharge Elimination System limits are created for the amount of discharge a wastewater facility can send out into the environment and still maintain Alaska's WQS.

WQS—The Alaska state water quality standards are guides to help create programs that protect and restore water quality in Alaska. These programs include the impaired water body list and the nonpoint source pollution program. The standards also help set the limits for state and federal discharge permits and cleanup standards for contaminated sites and landfills.

# APPENDIX D Logic Flow Diagram

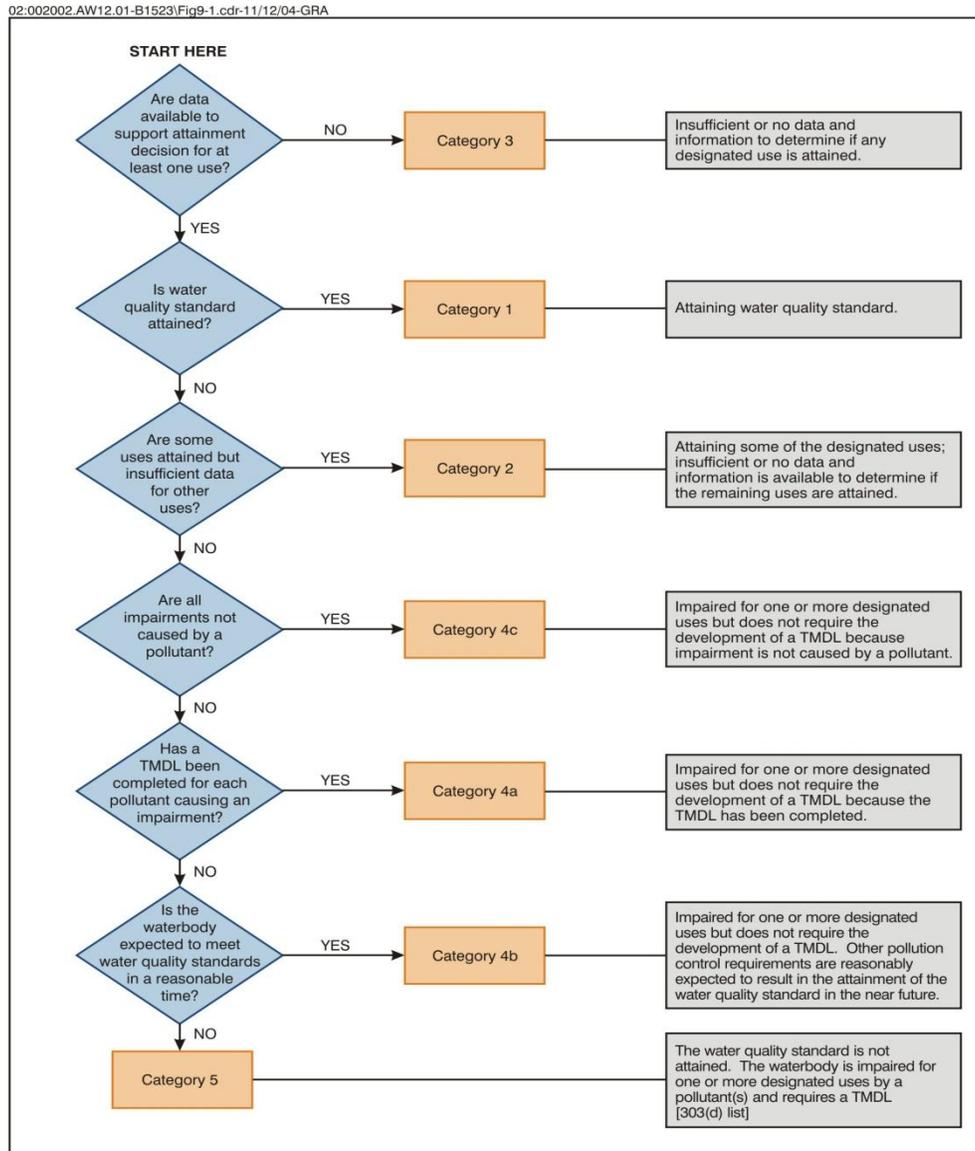


Figure D-1 Logic Flow Diagram for Making Category Determinations

## E. Alaska's List of Category 5/Section 303(d) Impaired Waters

## APPENDIX E List of Alaska's Category 5/ Section 303(d) Impaired Waters

**NOTE:** This appendix is an abbreviated and alphabetical list by Alaska regions of the Category 5/Section 303(d) list of impaired waters. The waters are listed alphabetically by region: Interior (IN), Southcentral (SC), and Southeast (SE).

#	Region	Alaska ID Number	Waterbody	Location	Area of Concern	Water Quality Standard	Pollutant Parameters	Pollutant Sources
1	IN	40506-007	Chena River	Fairbanks	15 miles	Sediment	Sediment	Urban Runoff
2	IN	40506-002	Chena Slough	Fairbanks	13 miles	Sediment	Sediment	Urban Runoff
3	IN	40402-010	Crooked Creek Bonanza Crooked Deadwood Ketchem Mammoth Mastodon Porcupine	North of Fairbanks	77 miles	Turbidity	Turbidity	Placer Mining
4	IN	40509-001	Goldstream Creek	Fairbanks	70 miles	Turbidity	Turbidity	Placer Mining
5	IN	30501-002	Kuskokwim River	Red Devil	0.2 mile	Toxic & Other Deleterious Organic and Inorganic Substances	Antimony, Arsenic, Mercury	Mining
6	IN	40506-003	Noyes Slough	Fairbanks	7 miles	Sediment Petroleum Hydrocarbons, Oils & Grease	Sediment, Petroleum Products	Urban Runoff
7	IN	30501-003	Red Devil Creek	Red Devil	0.5 mile	Toxic & Other Deleterious Organic and Inorganic Substances	Antimony, Arsenic, Mercury	Mining
8	IN	40510-101	Slate Creek	Denali National Park	2.5 miles	Turbidity	Turbidity	Mining
9	SC	20505-401	Big Lake	Wasilla	1,250 acres	Petroleum Hydrocarbons	Total Aromatic Hydrocarbons (TAH)	Motorized Watercraft
10	SC	30101-500	Cold Bay	King Cove, Alaska Peninsula	0.01 acre	Petroleum Hydrocarbons, Oils & Grease	Petroleum Products	Military, Fuel Storage
11	SC	20505-001	Cottonwood Creek	Wasilla	7 miles	Fecal Coliform Bacteria	Fecal Coliform Bacteria	Urban Runoff, Urban Development

E. Alaska's List of Category 5/Section 303(d) Impaired Waters

#	Region	Alaska ID Number	Waterbody	Location	Area of Concern	Water Quality Standard	Pollutant Parameters	Pollutant Sources
12	SC	30102-606	Dutch Harbor	Unalaska Island	0.5 acre	Petroleum Hydrocarbons, Oil & Grease	Petroleum Products	Industrial, Urban Runoff
13	SC	30203-001	Egegik River	Egegik	0.25 mile	Petroleum Hydrocarbons, Oil & Grease	Petroleum Products	Spills, Fuel Tanks, Under-ground Fuel Tanks
14	SC	20201-401	Eyak Lake	Cordova	50 feet of shore-line	Petroleum Hydrocarbons, Oils & Grease	Petroleum Products, Sheen	Above Ground Storage Tanks, Spills
15	SC	20401-412	Hood/Spenard Lake	Anchorage	307 acres	Dissolved Gas	Low Dissolved Oxygen	Urban Runoff, Industrial
16	SC	30102-602	Iliuliuk Harbor	Unalaska Island		Petroleum Hydrocarbons, Oils & Grease	Petroleum Products	Urban Runoff
17	SC	20402-001	Matanuska River	Palmer	½ mile	Residues	Debris	Landfill
18	SC	30101-502	Popof Strait	East Aleutians Borough	5 miles	Residues	Seafood Waste Residue	Seafood Processor
19	SC	30102-409	Red Lake Anton Road Ponds	Kodiak	2.0 acres	Toxic & Other Deleterious Organic and Inorganic Substances	Metals – Iron, Manganese	Urban Runoff
20	SC	20401-020	Ship Creek Glenn Hwy. Bridge. Down to Mouth	Anchorage	11 miles, Glenn Hwy. Bridge. Down to Mouth	Petroleum Hydrocarbons, Oils & Grease	Petroleum Products	Urban Runoff
21	SE	10203-002	Katlina River	N. of Sitka, Baranof Island	4.5 miles	Sediment Turbidity	Sediment, Turbidity	Timber Harvest
22	SE	10103-504	Salt Chuck Bay	Prince of Wales Island	0.03 square miles	Toxic & Other Deleterious Organic and Inorganic Substances	Metals - Copper	Mining
23	SE	10303-601	Skagway Harbor	Skagway	1.0 acre	Toxic & Other Deleterious Organic and Inorganic Substances	Metals - Cadmium, Copper, Lead, Mercury, Zinc	Industrial

E. Alaska's List of Category 5/Section 303(d) Impaired Waters

#	Region	Alaska ID Number	Waterbody	Location	Area of Concern	Water Quality Standard	Pollutant Parameters	Pollutant Sources
24	SE	10103-010	Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3027 (Stream 3)	Prince of Wales Island	0.4 mile	Toxic & Other Deleterious Organic and Inorganic Substances	Metals - Aluminum, Cadmium, Copper, Iron	Road Construction
25	SE	10103-012	Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3021 (Stream 6)	Prince of Wales Island	1.14 mile	Toxic & Other Deleterious Organic and Inorganic Substances, Dissolved Inorganic Substances	Metals - Aluminum, Cadmium, Copper, Iron, Manganese, Sulfate	Road Construction
26	SE	10103-013	Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3019 tributary (Stream 7)	Prince of Wales Island	0.3 mile	Toxic & Other Deleterious Organic and Inorganic Substances	Metals - Aluminum, Cadmium, Copper, Iron, Manganese	Road Construction
27	SE	10103-014	Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3019 (Stream 8)	Prince of Wales Island	0.3 mile	Toxic & Other Deleterious Organic and Inorganic Substances	Metals - Cadmium, Copper, Iron, Manganese, Nickel, Zinc	Road Construction
28	SE	10103-015	Unnamed Creek, Sweetwater Lake, USFS 3030 Road, ADF&G Stream 3017 tributary (Stream 9)	Prince of Wales Island	0.8 mile	Toxic & Other Deleterious Organic and Inorganic Substances, Dissolved Inorganic Substances	Metals- Aluminum, Cadmium, Copper, Iron, Manganese, Nickel, Zinc, Sulfate	Road Construction

# APPENDIX F Alaska Water Quality Management Programs

## Alaska Water Quality Standards

The protection of surface and groundwater occurs primarily through the development, adoption, and implementation of the water quality standards (WQS). The standards specify the degree of degradation that may not be exceeded in a state waterbody as a result of human actions. Alaska WQS were most recently revised on September 19, 2009.

The Alaska WQS (published in Title 18, Chapter 70, of the *Alaska Administrative Code* [AAC]) designate specific uses for which water quality must be protected. Seven uses for fresh waters and seven uses for marine waters are designated. Table F-1 identifies these uses.

**Table F-1 Designated Uses of Fresh Water and Marine Waterbodies in Alaska**

Designated Use	Fresh Water	Marine
Drinking Water	√	
Agriculture	√	
Aquaculture	√	√
Industrial	√	√
Contact Recreation	√	√
Non-contact Recreation	√	√
Growth and Propagation of Fish, Shellfish, Other Aquatic Life, Wildlife	√	√
Seafood Processing		√
Harvesting Raw Mollusks or Other Aquatic Life		√

By default, waterbodies in Alaska are protected for all designated uses. The few waterbodies for which some uses have been removed are listed in the WQS.

Although Alaska does not have any wetland-specific WQS and neither numeric nor narrative qualitative criteria are specific to wetlands, the Alaska WQS consider wetlands as “waters of the state”; consequently, Alaska’s WQS apply to wetlands.

State standards specify the pollutant limits, or criteria, necessary to protect the designated uses for a variety of parameters or pollutants for each of the 14 fresh water and marine uses. Attainment of standards is required for the following 12 pollutants:

- Color
- FC bacteria
- Dissolved oxygen
- Dissolved inorganic substances

***F. Alaska Water Quality Management Programs***

- Petroleum hydrocarbons, oils and grease
- pH
- Radioactivity
- Residues (floating solids, foam, debris, deposits)
- Sediment
- Temperature
- Toxic substances
- Turbidity

In the Section 305(b) assessment process for Section 305(b) of the federal CWA, waterbodies are compared to the standards for these parameters to determine whether persistent exceedances of water quality violations occur.

The WQS adopt the state primary drinking water maximum contaminant levels (MCLs) in the Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (18 AAC 70.020(b)(11)). Because the Alaska Drinking Water Program was given primacy by the EPA, the state MCLs have been in full compliance with the National Primary Drinking Water Regulations contaminant limits.

Alaska's WQS also contain provisions for antidegradation, mixing zones, natural conditions, short-term variances, ZODs, and carcinogenic risk levels for chemical contaminants. The antidegradation regulation is identical to federal law and requires protection of high quality waters such as waters of a national or state park, wildlife refuge, or a water of exceptional recreational or ecological significance. In a ZOD, a water quality standard may be exceeded under certain permit conditions.

Every 3 years, DEC conducts a comprehensive review of the WQS in 18 AAC 70. The triennial review is a CWA requirement that helps set pollution limits for Alaska's waters by integrating the most current science and technology. Further information on the triennial review can be found at <http://www.state.ak.us/dec/water/wqsar/trireview/trireview.htm>.

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## Alaska's Clean Water Actions

### Alaska's Approach to Water Resources Management

DEC participates in the implementation of the ACWA policy, which was initiated in 1999. Through the ACWA process, DEC, DNR, and ADF&G work together to focus state and federal resources to address issues of water quality, water quantity, and aquatic habitat for the waters with the greatest need. Information about ACWA is available at [http://www.state.ak.us/dec/water/acwa/acwa\\_index.htm](http://www.state.ak.us/dec/water/acwa/acwa_index.htm).

The cooperating agencies have developed a waterbody nomination and ranking process. The process uses established criteria to identify priorities for assessment, stewardship, and corrective action needs for polluted waters and waters at risk of pollution. These criteria include (1) the statutory criteria, (2) severity of pollution, and (3) expected uses of the waters, according to CWA Section 303(d)(1)(A).

An ACWA database uses four tracks to account for the nominated waterbodies: Data Collection and Monitoring, Adequately Protected Waterbodies, Waterbody Recovery, and Protect and Maintain Waterbodies at Risk.

The ACWA criteria were developed to assign a numeric value that identifies relative priority to each successfully nominated waterbody, resulting in the ACWA Priority Ranking. Waterbodies for which data are not sufficient to suggest a current or anticipated problem are placed in the Data Collection and Monitoring track. The waterbodies for which sufficient and credible data are available and for which those data suggest existence of a current water quality, water quantity, or aquatic habitat problem or the likelihood of future problems are subject to additional analyses. Those further analyses evaluate agency stewardship effectiveness and determine the persistence of standard exceedances or of regulation violations. Many of these waterbodies are entered in the Protect and Maintain Waterbodies at Risk or Waterbody Recovery database tracks.

Ranking the waterbodies enables agencies to focus resources on the most important priorities. Information on individual waterbody rankings are found on the web site cited above.

### Description of Ranking Criteria

The ACWA ranking criteria include an identical set of six common factors: allocation (refers to the extent to which the water has been obligated for various uses), condition, protection, future use, present use, and value applied broadly across each of three components:

- Water quantity;
- Water quality; and
- Aquatic habitat.

Each factor is assigned a high (5), medium (3) and lower (1) rating for each component.

### Application of the Ranking Criteria

Professional agency staff review readily available information and data related to a given waterbody and assign a factor rating using their best professional judgment for each factor. The agency most

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knowledgeable and familiar with the data is responsible for an individual component. For instance, DNR hydrologists are assigned the responsibility for providing factor-ratings for water quantity, ADF&G biologists are assigned the responsibility for providing aquatic habitat factor ratings, and DEC is assigned the responsibility for making water quality ratings. Waterbodies are ranked in descending order of their assigned ranking score. Numeric thresholds are established, and each waterbody is assigned a high, medium, or lower priority. More detailed information on the ranking process is available online at [http://www.dec.state.ak.us/water/acwa/acwa\\_ranking.htm](http://www.dec.state.ak.us/water/acwa/acwa_ranking.htm)

### Funding Priorities

Funding to support high-priority protection and restoration efforts identified by the ACWA process may come from state agencies such as DEC, DNR, or ADF&G. Each funding source has a unique set of obligations and conditions for use.

A single, integrated solicitation process that captures the requirements associated with each potential funding source was developed in 2003. The consolidated solicitation process reduces the burden on applicants by providing a “one-stop shopping” approach to their funding searches. It facilitates the project evaluation and award process of the agencies by providing, in one process, the ability to optimally match projects with the best funding source and provide all information required to make the funding awards. Project evaluations and matches to funding sources are accomplished by an interagency team representing all resource management and funding source agencies.

### ACWA Priority Actions

ACWA priority water actions (the needed actions on the ACWA-priority waters) are identified for approximately 20 to 30 Alaska's waters on an annual basis. Grant funds are made available for these waters. Seventeen projects were funded for actions from July 2009 to June 2010. Specific information on actions request and grants funded is available at [http://dec.alaska.gov/water/acwa/acwa\\_index.htm](http://dec.alaska.gov/water/acwa/acwa_index.htm).

### Alaska Water Monitoring and Assessment Strategy

DEC developed a long-term Water Quality Monitoring and Assessment Strategy (Strategy) to guide its stewardship of Alaska's marine and fresh waters. The complete document presenting the Strategy, which was completed in June 2005, is available for review at [http://www.dec.state.ak.us/water/wqsar/monitoring/DEC\\_monitoring\\_strategy\\_final\\_2005.pdf](http://www.dec.state.ak.us/water/wqsar/monitoring/DEC_monitoring_strategy_final_2005.pdf).

The Strategy is intended to meet the federal expectations for state water quality stewardship activities enumerated in the CWA in a manner influenced by the unique needs and challenges of Alaska. The Strategy integrates policy and program elements embodied in the ACWA policy and in the EPA *Consolidated Assessment and Listing Methodology* and *Elements of a State Water Monitoring Program* documents. The major policies of the ACWA and EPA define specific objectives for the Strategy from state and federal perspectives.

The purposes of the Strategy document are to (1) serve as a framework for Alaska resource agency decisions required for assessing and monitoring Alaska's water resources; (2) support protection and

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restoration decisions; and (3) serve as a roadmap for improving state, federal, local, tribal, and public capabilities and performance over time for monitoring the status and trends of Alaska's water resources.

The Strategy focuses on what can be done with available financial resources, considering the abundance of Alaska's water resources. Because of this abundance, Alaska must establish priorities for applying limited state resources for monitoring and assessing state water resources. The Strategy touches on waterbody level monitoring through ACWA and ambient analysis through the Alaska Environmental Monitoring and Assessment Program.

The Strategy is organized around ten elements that must be addressed to ensure that monitoring and assessment activities are conducted on a rational basis and in a manner that ensures information is of good quality and is accessible for resource management decisions. Those elements are as follows:

- Monitoring Program Strategy
- Monitoring Objectives
- Monitoring Design
- Core and Supplemental Water Quality Indicators
- Quality Assurance
- Data Management
- Data Analysis/Assessment
- Reporting
- Programmatic Evaluation
- General Support and Infrastructure Analysis

The Strategy enables DEC to revise monitoring programs based on emerging needs. For example, the monitoring programs can be adapted to evaluate the impact of global changes on Alaska waters. DEC recognizes that sources external to Alaska may affect water quality. Information or direction from the Alaska Climate Change Task Force (<http://www.climatechange.alaska.gov/>) can be incorporated into future waterbody assessments and listing methodologies. The Task Force has direct responsibility for a host of climate change impacts, including the assessment of warming estuaries and fresh water habitat that support fisheries. The Task Force also intends to seek funding for an ocean acidification research and monitoring plan.

In 2006, EPA Region 10 completed a review of and accepted the DEC Strategy.

### Alaska's Aquatic Resource Surveys – Probabilistic Assessments

Probability-based assessments are part of the DEC Water Quality Monitoring and Assessment Strategy. Seven regional probabilistic assessments of fresh water and marine aquatic resources (Figure F-1) have been conducted since 2002. The discussion below addresses the 2002 Southcentral coastal, Tanana River Basin, and Interior Alaska wadeable stream assessments, for which final reports have been completed. The full reports are available at [http://www.dec.state.ak.us/water/wqsar/monitoring/emap\\_Map.htm](http://www.dec.state.ak.us/water/wqsar/monitoring/emap_Map.htm) and in the EPA *National Coastal Condition Report III* (2008). Field surveys have been completed on the Yukon River (2009), Cook Inlet Lakes (2008), Coastal Aleutian Islands (2006 and 2007), and Coastal Southeast Alaska (2004). Results of these surveys are not yet available for inclusion in the 2010 report.

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**Figure F-1 Location Map**

Because of the low population density and limited industrial and agricultural activities that characterize the state, Alaska's aquatic resources are often assumed to be in pristine or near-pristine condition. However, long-range atmospheric and oceanic transport from the more populated and industrialized centers are delivering contaminants to Alaska. The assessments reported on in this appendix utilized "core national indicators" as part of the EPA National Aquatic Resource Survey program. Currently, the core indicators and sampling design used in Alaska are not designed to assess condition of aquatic resources related to accumulation of contaminants at the trophic level of the food web nor climate change impacts, such as ocean acidification.

### Southcentral Alaska Coastal Survey

DEC collected data at a total of 55 sites that covered the geographic range from Unimak Island in the southwest study area to the Copper River Delta area in the northeast study area. The target study area included coastal bays and estuaries in Southcentral Alaska, including the Alaska Peninsula, Kodiak Island archipelago, Cook Inlet, the Kenai Peninsula, and Prince William Sound.

The Southcentral Alaska coastal assessment utilizing the core indicators of the EPA National Coastal Assessment (NCA) sampled 55 locations. Based on three of the NCA indices (water quality, sediment quality, and fish tissue contaminants), the overall condition was rated good. National indices indicating poor conditions for water clarity at some sites did not account for conditions natural to this region, i.e. glacial flour. High levels of chromium and nickel were found at one site near Chrome Bay, for which a subsequent assessment was conducted in 2009 (results pending) to determine if these results represent the natural condition. Because of the lack of current and historical biological data, it was not possible to assess appropriate benthic or coastal habitat indices for this region. The percentage of coastal area in

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good, fair, poor, and missing categories for each NCA index and component indicator is shown in the report, which is available at <http://www.dec.state.ak.us/water/wqsar/Docs/EMAPSC2%20Report.pdf>.

### Tanana River

The Tanana River originates in the Yukon Territory, Canada, flows west, and discharges into the Yukon River near Tanana, Alaska (Figure 1 above). The basin covers more than 44,700 square miles and lies south of the Yukon River where discontinuous permafrost has been thawing in recent decades (Jorgenson and others, 2001).

DEC collected water-quality data from 84 sites along the navigable rivers in the Tanana Basin from October 2003 through September 2006 as part of a cooperative study between the USGS and DEC Alaska Monitoring and Assessment Program (AKMAP). A broad range of chemical analyses were conducted for 93 sets of samples collected at 59 tributaries to the Tanana River and at 25 locations along the mainstem. In situ pH, specific conductance, water temperature and DO concentrations were measured, and samples were analyzed for major ions, dissolved organic carbon, and oxygen isotopes.

The report for the Tanana River Basin Survey can be found at [http://www.dec.state.ak.us/water/wqsar/Docs/USGS\\_ofr20071390.pdf](http://www.dec.state.ak.us/water/wqsar/Docs/USGS_ofr20071390.pdf). This report contains the field water-quality constituents and water-quality data analyzed by USGS from October 2003 to September 2006.

### Alaska Interior Wadeable Stream Assessment

The Alaska Interior Wadeable Streams Assessment summarizes field data collected during 2004 and 2005 as part of a study designed to assess the ecological condition of wadeable, perennial streams in the Tanana River basin of Interior Alaska. This project was conducted in conjunction with the EPA Wadeable Streams Assessment (WSA). Funded by EPA, the Alaska WSA study was a cooperative effort among EPA, DEC, the Environment and Natural Resources Institute (ENRI) of the University of Alaska Anchorage, the School of Fisheries and Ocean Sciences of the University of Alaska Fairbanks, and USGS. Although information from this assessment was not included in the national EPA report, Alaska produced a report summarizing the findings. Fresh water indices (water quality, sediment, and biological conditions) are included. Forty-two Tanana River Basin streams were analyzed, representing 7,754 miles of stream.

The report is available at [http://www.dec.state.ak.us/water/wqsar/monitoring/Tanana\\_Wadeable\\_Str\\_Rep\\_Final.pdf](http://www.dec.state.ak.us/water/wqsar/monitoring/Tanana_Wadeable_Str_Rep_Final.pdf). Summaries are presented of the most important physical, chemical, habitat, and biological metrics. Preliminary results of a modeling approach for helping detect and diagnose changes in ecological condition at stream sites based on deviations from predicted macroinvertebrate functional feeding group composition are discussed.

### Nonpoint Source Pollution Program

Because much of Alaska is undeveloped and relatively pristine, the primary emphasis of the nonpoint source pollution strategy is prevention. In populated areas, however, many waterbodies, including

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important salmon streams, have been degraded and need restoration. Waterbody restoration plans are developed and implemented for waterbody locations where water quality is impaired. Restoration strategies for polluted waterbodies consider the entire watershed and include measures to control the sources of pollution to prevent future degradation. Restoration activities are designed to achieve a water quality condition appropriate to the specific site.

Nine key elements have been identified by EPA as necessary for an effective nonpoint source program in Alaska:

- Explicit short- and long-term goals, objectives, and strategies to protect surface and groundwater
- Strong working partnerships and links to appropriate state, tribal, regional, and local entities (including conservation districts), private-sector groups, citizens' groups, and federal agencies
- A balanced approach that emphasizes both statewide nonpoint source programs and on-the-ground management of watersheds where waters are impaired and threatened
- Abatement of known water quality impairments resulting from nonpoint source pollution and prevention of significant threats to water quality from present and future activities
- Identification of waters and watersheds impaired by nonpoint source pollution and important unimpaired waters that are threatened or otherwise at risk. Alaska's Nonpoint Source Water Pollution Program includes a process of progressively addressing these waters by conducting more detailed watershed assessments, developing watershed/waterbody implementation plans, and implementing those plans
- Review, upgrades, and implementation of all program components and establishment of flexible, targeted, and iterative approaches to achieve and maintain beneficial uses of water, including (1) a mix of programs based on water quality, technology, or both; (2) a mix of regulatory, nonregulatory, financial, and technical assistance as needed to achieve and maintain beneficial uses of water; and (3) incorporation of or cross references to existing baseline requirements established by other relevant federal or state laws
- Identification of federal lands management and activities that are not managed consistently with the objectives of Alaska's nonpoint source program
- Efficient and effective program management, including necessary financial management
- Periodic review and evaluation using environmental and functional measures of success in which sources of nonpoint source pollution are assessed and the management program is revised at least every 5 years

These nine key elements have been incorporated and integrated with ACWA policy in the Alaska Nonpoint Source Water Pollution Control Strategy. This strategy is available at [http://www.dec.state.ak.us/water/wnpspc/pdfs/2007\\_NPSSstrategy.pdf](http://www.dec.state.ak.us/water/wnpspc/pdfs/2007_NPSSstrategy.pdf). The following general sources of nonpoint source pollution are addressed:

- Urban and community development
- Forest practices

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- Harbors and marinas
- Hydromodification
- Mining
- Agriculture
- Road, highways, and bridges

Maintenance of good water quality can only be achieved when all sources of pollution are considered, resources are used for the highest priorities, and people work together to prevent pollution and achieve clean water goals. Integration of the nine key program elements listed above with the ACWA priorities ensures that stewardship and prevention, monitoring and, when necessary, restoration actions are implemented.

### Coastal Nonpoint Source Pollution

Strategies for nonpoint water pollution control include implementation of the *Alaska Coastal Clean Water Plan*, published as a Public Review Draft in August 1995, and the requirements of the Coastal Zone Act Reauthorization Amendments (CZARA) (Section 6217).

Most management measures of CZARA Section 6217 are implemented through existing state programs and authorities, including the following:

- State certification of federal permits and activities that WQS will be met
- Fish habitat protection
- Water rights appropriations
- *Alaska Coastal and Harbor Design Procedures Manual*
- Harbor management agreements
- Forest Resources and Practices Act
- Regulations and erosion and sediment control plans for dam construction

The management measures are intended to ensure appropriate protection occurs during the efficient use of resources.

### BEACH Grant Program

The goal of the Alaska BEACH Grant Program is to provide funding that helps Alaskan communities monitor the state's marine beaches for fecal pollution.

DEC surveyed Alaska coastal communities and found that some beaches more likely to have a higher level of bacterial contamination than others. To learn more about the extent of possible sources of the presence of FC bacteria or enterococci bacteria, DEC has entered into an agreement or memorandum of understanding (MOU) with several coastal communities that will be able to apply for BEACH Grant funding. These cooperating communities will work with DEC for water quality monitoring, community notification, and training.

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### The BEACH Act of 2000

The Beaches Environmental Assessment and Coastal Health (BEACH) Act was signed into law in October 2000 in response to concerns that people were becoming ill after visiting local shores/beaches, especially when they came into direct contact with the water during recreational activities. EPA awards grants to state and tribal authorities to assist with the implementation of beach water monitoring and advisory notification programs. More information on the EPA beach program can be found at <http://www.epa.gov/beaches/>.

### Alaska Beach Monitoring Program

With the assistance of interested organizations and the general public, DEC has developed a beach monitoring program to evaluate the possible risk to recreational beach users in Alaska. By notifying the public in the event that a sample exceeds the allowable levels, this program will help prevent illnesses that could result from exposure to contaminated beach water.

#### *Identification of Alaska Beaches*

The DEC BEACH Grant Program defines a beach as “any shoreline where recreational activities may bring a person into complete or partial body contact with marine water.” According to this definition, a beach may include sections of a shoreline that do not appear to look like a sandy beach.

A Recreational Beach Survey was performed in 2003 to gather information from coastal communities about the recreational use of beaches in their areas. The 60 responses received identified 203 recreational-use beaches as areas that were used for recreational purposes. These beaches were located in 53 coastal Alaska communities.

#### *Current Status of the Alaska BEACH Program*

DEC funds monitoring and development of phases of the BEACH program by local communities and tribal governments through the ACWA/BEACH grant process. Communities (including Dillingham, Haines, Juneau, Naknek, and Homer) have monitored local recreational beaches for indicator bacteria using funding from the Alaska BEACH Grant Program since summer 2007. The program supports monitoring of marine water quality adjacent to high-use beaches. Grantees sample beach water for organisms (FCs and enterococci bacteria) that indicate the presence of fecal contamination.

Funding for beach monitoring will be made available through the ACWA/BEACH grant process to communities with high-priority beaches. More information about the Alaska BEACH grant program is available at <http://www.dec.state.ak.us/water/wqsar/wqs/beachprogram.htm>.

## Point Source Pollution Program

### Overall Approach

DEC's point source pollution program covers more than 1,000 permitted facilities and activities throughout the State of Alaska. DEC's overall approach to water quality management is to focus staff resources on facilities and activities that pose higher risks to public health or the environment. Efforts are under way in five broad categories.

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**Delegation of the Wastewater Permitting Program**

In October 2008, EPA formally approved the state's application to administer the NPDES wastewater permitting and compliance and enforcement program for point source discharges of pollution to waters of the United States. The state's program is called the Alaska Pollutant Discharge Elimination System (APDES) Program.

Authority to administer the federal program will transfer to DEC during 3 years beginning at program approval and ending October 2011. Until authority over a facility transfers to DEC, EPA will remain the permitting and compliance and enforcement authority for that facility. The phasing schedule and list of facilities in each phase is available for review at the following DEC web page:  
<http://www.dec.state.ak.us/water/npdes/APDESAuthorityTransferSchedule.htm>.

DEC will continue to issue state individual and GPs for discharges that do not require an NPDES permit. DEC also will continue to review permits for facilities still under EPA authority for water quality impacts.

**Focus on High-Priority Permits**

Staff focus on improving and updating permits for facilities and activities that pose a higher risk to human health or the environment by working on APDES and federal NPDES individual permits for all large-volume, major dischargers, and by using new or reissued GPs that standardize the review of similar or lower-risk projects. DEC also regulates domestic wastewater treatment facilities that are not permitted by the EPA but need a discharge permit and are important to the human health in smaller Alaskan communities. Finally, DEC prioritizes facilities to be inspected through the use of a risk-based scoring and ranking model as well as by applying national EPA priorities.

**Enhancement of Compliance**

A facility's compliance with effluent limits and operational conditions designed to protect water quality is enhanced by assistance from DEC staff, who have extensive experience with a wide variety of local conditions and waste treatment technologies. Routine review of monitoring records submitted to DEC and follow-up as needed also yield incremental improvements in the ambient water quality.

**Provision of Technical Information**

Trained and technically competent staff are accessible through various telecommunication tools that bridge the vast distances that characterize Alaska. The staff support to permittees and their consultants provides technical assistance and resources for information about successful technologies and practices for wastewater treatment and discharge.

**Streamlining of the Permitting Process**

Regulatory compliance is facilitated by streamlined application, fee payment, and electronic reporting; permit conditions that focus on cost-effective practices gleaned from statewide experience; and consistent application of requirements across industry sectors on pollutants of concern. Also, a modern

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data system provides an analytical tool to support improvements in other aspects of DEC's water quality program, e.g., improvements to Alaska WQS.

**Protection of Subsurface Wastewater**

DEC wastewater engineers review plans for onsite wastewater systems (septic systems), wastewater lagoons, and underground injection control (UIC) wells (specifically, EPA Class V injection wells). Underground disposal systems and injection wells can pose a threat to groundwater quality and affect drinking water sources. Common examples in Alaska are sumps, drains, drywells, and drainfields that are used to dispose of septic tank effluent and wells for commercial wastewater, and injection. Class V wells are also used for the disposal of stormwater and snow melt. Contaminants associated with injection wells can include nutrients, bacteria, viruses, solvents, antifreeze, used oil, and dissolved heavy metals. These pollutants can degrade groundwater aquifers that serve as wells for public or private drinking water systems. DEC reviews ensure that domestic wastewater (septage and sewage) is properly treated, stored, handled, and disposed of in a safe and sanitary manner. Poorly designed systems can also cause groundwater to migrate to and pollute surface waters, especially in areas with high water tables or near tidally influenced waterbodies.

DEC engineers also review and approve plans for the design and construction of domestic and commercial wastewater treatment, storage, and disposal facilities. Staff also review monitoring reports for treated wastewater discharges to the surface of the land or into the ground that may affect the groundwater. Information from the domestic wastewater program is used to create maps that show the location of septic systems, identified UIC wells, wastewater treatment systems, and sewage lagoons when completing public water system source water assessments for the drinking water protection program (see Drinking Water section below).

**Regulation of Stormwater**

Stormwater discharges are generated by runoff from land and impervious areas, such as paved streets, parking lots, and building rooftops during rainfall and snow. This runoff often contains pollutants in quantities that could adversely affect water quality.

Authority to administer the Stormwater Program transferred to DEC on October 31, 2009. The point source stormwater program focuses on two types of stormwater: (1) subject to APDES permitting requirements and stormwater(2) handled by treatment and discharge systems.

Stormwater discharges that require an APDES permit include discharges from construction sites disturbing 1 or more acre of land, certain industrial facilities, and municipal separate stormwater sewer systems (MS4) in the Anchorage and Fairbanks areas. APDES stormwater permits require proper site control and rainfall and snowmelt. Runoff is treated, and contact with pollutants is prevented with good site design and construction.

Under 18 AAC 72.600, DEC reviews and approves engineering plans for stormwater treatment and discharge systems. The goal of this review is to ensure that permanent stormwater systems are designed and constructed to meet pollutant removal criteria and BMPs.

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**Environmental Compliance Program for Commercial Passenger Vessels**

In 2001, Alaska passed an innovative pollution prevention law that applies to passenger vessels, including some Alaska Marine Highway System vessels. The law is applicable for both small passenger vessels, serving 5 to 249 people, and large passenger vessels, serving 250 or more people. The Commercial Passenger Vessel Environmental Compliance Program (Cruise Ship Program) implements the law and ensures that cruise ships and ferries comply with wastewater effluent and visible emission standards. Effluent limits are set for both graywater (e.g., water from showers and dishwaters) and blackwater (e.g., toilet water).

There have been two changes to the original law. In 2004, the Legislature revised the law that applied to small passenger vessels. It allowed small passenger vessels to implement BMPs to manage their wastewater discharge; for example, discharging only while underway. In August 2006, the voters approved a citizen-sponsored cruise ship ballot initiative. The new law requires that cruise ships obtain wastewater permits in order to discharge. It also requires that observers—Ocean Rangers—be placed on board cruise vessels while in Alaska waters. The Cruise Ship Program is in the process of issuing a wastewater discharge GP. DEC is also in the process of hiring a contractor to place Ocean Rangers on board ships during the 2010 cruise season.

The Cruise Ship Program also conducts scientific research to assess the impact of cruise ship wastewater on the environment in Alaska and may create additional standards if science and technology warrant. The state law also addresses the offloading or disposal of nonhazardous solid wastes (besides sewage) and hazardous wastes in Alaska. Vessel owner/operators are required to annually submit a description of the vessel procedures for handling nonhazardous and hazardous waste and to report any deviations from the vessel plan to DEC. The Cruise Ship Program is supported by industry fees.

**Drinking Water Program**

The Drinking Water Program consists of four interrelated sections charged with oversight of public water systems (PWSs). The sections and additional areas of responsibility are identified below:

- Engineering;
- Compliance and Monitoring—PWS compliance and enforcement activities;
- Statewide Technical Services—Drinking water protection, Alaska PWS Database, PWS security and emergency response planning, and statewide PWS compliance and enforcement coordination; and
- Program Management and Administration.

**Public Water System and Drinking Water Compliance**

Staff in the Compliance and Monitoring, Engineering, and Statewide Technical Services sections primarily compose the Drinking Water Program's compliance and enforcement group for the Drinking Water Program. These compliance and enforcement activities are referred to as the Public Water System Supervision (PWSS) Program. The Alaska PWSS Program focuses on PWSs that are federally regulated, which are systems that provide drinking water to 25 or more individuals and do not include

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single-family homes or duplexes with their own private wells. Alaska has approximately 1,570 federally regulated PWSs, according to an October 1, 2009, inventory. This inventory figure is dynamic, changing frequently in the course of a year. Some PWSs are seasonal, shutting down for 6 to 9 months of the year. In addition, many systems are slowly going out of business, disbanding, or being consolidated into larger systems, and many small community-type systems are starting up in the areas of rapid growth, such as the Matanuska-Susitna Valley.

Both the State of Alaska and the federal government classify PWSs based on population served and duration of operation, regardless of whether the drinking water source is groundwater or surface water. The federal (EPA) classifications for PWSs are Community Water Systems (CWS), Non-transient Non-community Water System (NTNCWS), and Transient Non-community Water Systems (TNCWS). The State of Alaska adopted the federal nomenclature for PWS classification effective April 2009. Alaska's October 2009 PWS inventory showed 436 CWS, 245 NTNCWS, and 892 TNCWS.

Alaska is a primacy state for drinking water and has direct oversight of PWSs within the state. The state is required to complete the timely development or adoption of federal drinking water rules and obtain and maintain primacy for all drinking water rules and required drinking water initiatives. As a primacy state, Alaska is required to implement the state PWSS Program to meet the intent and requirements of the SDWA and its 1986 and 1996 amendments.

The Alaska PWSS Program does not create, measure, or develop data. Rather, it provides for collection of information routinely sent directly to the Drinking Water Program staff. The information collected and the responsible parties are identified below:

- PWS compliance monitoring data, prepared by DEC-certified laboratories
- Operator reports, provided by PWS owners or operators
- Sanitary survey inspector reports, prepared by DEC Drinking Water Program staff and DEC-certified third party sanitary survey inspectors

Drinking Water Program engineering staff also complete component assessments of onsite water system status and comprehensive performance evaluations of Alaska PWSs to confirm that systems were built as approved and to provide information to PWS owners to better optimize system performance. Staff review and either approve or disapprove the engineered plans for PWS treatment, storage, and distribution systems. The program requires that PWSs produce treated water that meets the standards set by federal rules and state regulations for the regulated drinking water contaminants. The program receives, stores, and uses monitoring data on PWS compliance for the regulated drinking water contaminants as well as any specific rule requirements to confirm that the health of the customers being served by a PWS is protected. The program requires that PWSs be in compliance with SDWA requirements, federal rules, and state regulations at all times. If a PWS is in noncompliance, Drinking Water Program staff provide technical and compliance assistance. The staff also take appropriate enforcement actions or may refer the PWS to EPA for enforcement.

All PWS location data for Alaska's federally regulated PWSs was provided to the EPA approximately 5 years ago (2004). Alaska PWS location data for new systems and existing treatment systems, wellhead (groundwater source), and intake (surface water source) are routinely checked during the sanitary survey process. Any changes in location data are corrected in the state-maintained PWS Safe Drinking Water

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Information System (SDWIS) database, which is named SDWIS/State. All routine data for federally regulated PWSs are reported to EPA during monthly or quarterly data transfers. This information includes the State of Alaska PWS inventory, source types, populations served, latitude and longitude of new treatment systems and source intakes or updated information from existing systems, compliance monitoring data, enforcement actions, and operator reports.

Alaska is also required to submit to EPA an annual public water system compliance report for its PWSS Program. First submitted in 1996, the annual compliance report must be submitted to EPA by July 1 of each year for the previous calendar year, unless designated otherwise by EPA.

### **Drinking Water Protection**

The Drinking Water Protection (DWP) component of the statewide Drinking Water Program ultimately focuses on the assessment of water supplies used by Alaska PWSs for drinking water purposes and the protection of groundwater supplies used by public drinking water systems. Through an extensive public involvement process, Alaska developed its Drinking Water Protection Program, a combined source water assessments and Wellhead Protection Program for PWS, which was approved by EPA on April 4, 2000. This component of the statewide DWP combines activities and information from PWS source water assessments and Wellhead Protection Management Plans (WPMPs), and focuses on the protection of drinking water produced and distributed by PWSs that use surface water, groundwater, or combined sources.

The initial project to complete source water assessments of Alaska PWSs has been completed. A total of 1,668 source water assessments were completed for 1,427 PWSs. Currently, source water assessments for new PWSs are being completed after the system is built and inventory information is documented in SDWIS/State. Since July 1, 2004 (the EPA deadline for completion of PWS source water assessments for existing systems by primacy states), and as of October 2009, 257 new PWS source water assessments have been completed. The following activities associated with the source water assessment process also have been completed: 361 PWS delineations, 281 contaminant source inventories, and 280 vulnerability analyses. The source water assessment process includes identifying source water (drinking water) protection areas using a series of uniform flow equations and watershed delineations; completing a contaminant source inventory of all potential and existing sources of regulated drinking water contaminants within the protection areas; and completing a vulnerability assessment based on the level of risk associated with identified potential and existing contaminant sources. The goal of completing PWS source water assessments is to identify and prioritize contaminant risks to public water supplies as a basis for protection efforts. These protection efforts will be largely undertaken at a local level and will be supported by the state through possible regulations, guidance documents, fact sheets, and Wellhead Protection Program activities. The source water assessments will also be a crucial tool for use by the state in assisting operators and owners of PWSs in achieving compliance with the EPA Groundwater Rule, promulgated November 8, 2006.

During fiscal year 2004, an interactive CD-ROM was developed and produced for PWS owners, managers, operators, and communities to use to develop their WPMPs. The CD directs the users through the information entry process with easy-to-use methodology and easy-to-understand instructions. The end product is a written wellhead protection plan specifically designed for a particular public drinking water system or local community. The completed source water assessment report and the most recent

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sanitary survey are then added as appendices to the plan, resulting in a complete and comprehensive WPMP for the system.

DWP staff have continued further development and implementation of a statewide voluntary Public Water System Wellhead Protection Program. To accomplish this goal, DWP staff assisted communities and PWS owners and operators in developing WPMPs for their systems through the use of the interactive CD-ROM (previously described) and completed public outreach through workshops and presentations on wellhead protection tools and strategies. Additionally, DWP staff assisted the Alaska Rural Water Association (ARWA) Source Water Protection Specialist in presenting joint workshops on both PWS wellhead protection and source water protection planning. Community support is essential for an effective local Wellhead Protection Program, which includes development and implementation of a WPMP.

The Wellhead Protection Advisory Committee recommended to the State of Alaska, DEC Drinking Water Program, that the statewide voluntary Public Water System Wellhead Protection Program be renamed the "Drinking Water Protection Advisory Committee." The advisory committee recommended and approved the creation of "Endorsed Drinking Water Protection Plans" and redefined the definition of "substantial implementation," a term used by EPA to measure protection strategies that minimize the risk of contamination of a source of drinking water. A list of these recommendations can be reviewed on the Drinking Water Program website at <http://www.dec.state.ak.us/eh/dw/DWP/WAC.htm>.

As of October 2009, 32 PWSs had substantially implemented a Drinking Water Protection Plan. These 32 PWS provide drinking water to 338,735 consumers. More than 50% of the residents and visitors of the State of Alaska receiving water from a PWS receive water from systems with a substantially protected source of drinking water.

Criteria for the Endorsed Drinking Water Protection Plans were established in conjunction with ARWA criteria for the development of protection plans for which ARWA assists communities with development. As of October 2009), ten water systems had Endorsed Drinking Water Protection Plans. It is hoped that new fiscal incentives from the ACWA grant program will help facilitate the development of Endorsed Drinking Water Protection Plans. DWP staff continues to work toward identifying the communities that are currently implementing protection strategies. The communities that are implementing protection strategies will be recognized and may qualify for future incentives. In the meantime, DWP staff focus their efforts on communities that do have protection strategies in place.

In fiscal year 2009, the Drinking Water Protection Group collaborated with the ACWA grant program, which is a multi-agency effort. The DEC Drinking Water Program, Drinking Water Protection Group, contributed \$10,000 from the Drinking Water State Revolving Fund (DWSRF), Local Assistance and Other State Programs set-asides. These funds are to be used toward proposals that promote or develop stewardship strategies leading to increased protection of water sources used for public drinking water supplies. The first grant, which also incorporated CWA funding, was awarded to Friends of Mat-Su for fiscal year 2010. Funding this project allowed Friends of Mat-Su to develop an educational outreach program for homes and businesses around Lake Wasilla, where more than 20 PWS wells are located within 2,000 feet of the lake. Education outreach is expected to focus on key issues of septic system location and maintenance, proper well construction, well decommissioning (abandonment) procedures, and discontinued use and closure of waste disposal wells for Class V motor vehicles. In the future, the

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grant program will be used to assist community PWSs develop or implement DEC Endorsed Drinking Water Protection Plans.

Vulnerability assessments of public water supplies, which are part of the source water assessment process, can serve as a foundation for comprehensive management and protection of Alaska's groundwater resources. In addition, they can assist a PWS owner using a groundwater source achieve and maintain compliance with the Groundwater Rule and can support future commercial and industrial growth. Information gathered and generated during the initial years of the source water assessment program for public water supplies can be used to enhance the protection of lakes, rivers, and streams in populated areas by validating or improving on the TMDL values used to issue permits to discharge wastes. This information can also be used to establish TMDLs to manage the discharge of wastes to aquifers; identify critical sole-source aquifers used as a drinking water supply by a PWS; identify any areas of declining groundwater levels or degrading groundwater quality; and perform unified watershed assessments statewide.

If a PWS provides drinking water that meets all the health-based standards set by the SDWA on a consistent and adequate basis, good public health protection is established for the customers served by that PWS. All activities completed in the Drinking Water Program support the overall goal of requiring that PWSs provide both a safe and adequate supply of drinking water for the residents and visitors to the State of Alaska.

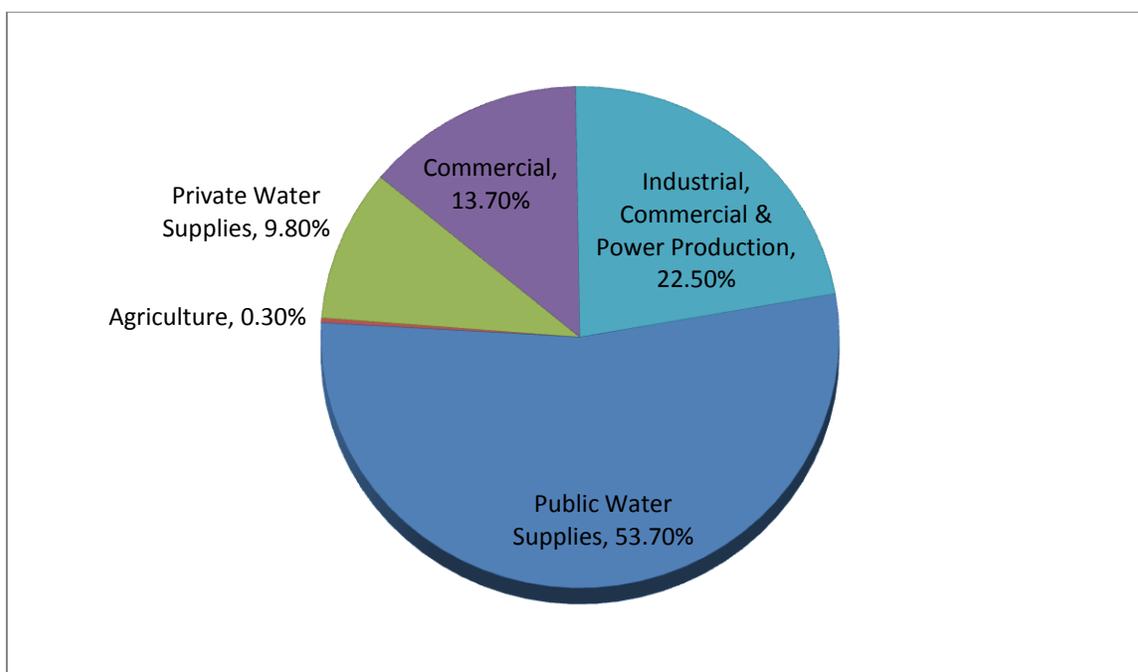
More information on source water assessments, completed assessment reports of PWS sources, and wellhead protection activities, is available on the DEC Drinking Water Program, Source Water Assessment, and Wellhead Protection web pages at <http://www.dec.state.ak.us/eh/dw/DWP/complete.aspx>.

### Groundwater Protection

**Groundwater Importance:** Alaska's groundwater resources may be among the most abundant in the nation. However, very few of Alaska's aquifers have been studied (or even located), and limited water quality data are available.

Alaska is sparsely populated by approximately 686,000 residents. Urban development is concentrated in a few main population centers, with the majority of people living in Southcentral Alaska. Nearly one-half of the state's population lives in the Municipality of Anchorage. Other major population centers include Fairbanks, in interior Alaska, and Juneau, the state capital, in southeast Alaska. Beyond these major population centers, communities tend to be small and generally not connected by roads.

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**Figure F-2 Groundwater Uses**

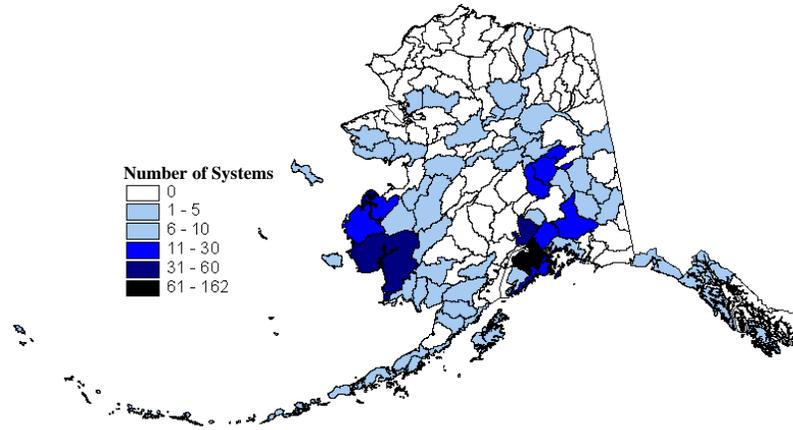
Groundwater is a source of drinking water for about 50% of the overall state population and for 90% of the rural residents. Eighty-three percent of Alaska's 1,573 public drinking water systems use a groundwater source. The total groundwater withdrawn for these PWSs represents only 37% of the total fresh water used by all Alaska PWSs. This small amount of fresh water use is due to a small number of PWSs serving a large number of people from surface water sources. Examples of the systems serving many people are those in Anchorage, Cordova, Ketchikan, Kodiak, and Sitka. Ninety percent of the private drinking water supplies use groundwater. Of the estimated 63 million gallons of groundwater used in Alaska each day, more than 50% (34 million gallons per day [mgd]) is used for public water supplies. Approximately 23% (14 mgd) is used for industrial, mining, and power production; roughly 10% (6 mgd) is used for domestic water purposes; 14% (9 mgd) is used for commercial purposes, and less than 1% (<1 mgd) is used for agricultural purposes.<sup>1</sup>

**Groundwater Water Availability:** Groundwater is available in most areas of Alaska, except where permafrost is very deep in the northern part of the state. Southcentral and interior Alaska have the greatest dependence on groundwater. Water systems in Arctic, Western, and Southeast Alaska more frequently use streams, rivers, lakes, and rainwater catchments. The largest groundwater withdrawals occur in Anchorage, the Fairbanks North Star Borough, Matanuska-Susitna Borough, and Kenai Peninsula Borough. Figure F-3 shows the distribution of PWSs that use groundwater.

Most of Alaska's aquifers consist of unconsolidated materials derived from glaciers, rivers, and streams. Producing aquifers are typically unconfined (i.e., not protected by a layer of clay or silt), and the depth to groundwater ranges from a few feet to more than 400 feet statewide.

<sup>1</sup>The statistics presented are based on estimates provided by the Alaska Department of Natural Resources.

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**Figure F-3 Distribution of Community & Nontransient/Noncommunity Public Water Systems in Alaska Using Groundwater**

**Water Quality:** Although water quality data are sparse, most of the state's groundwater is suitable for domestic, agriculture, aquaculture, commercial, and industrial uses with moderate or minimal treatment. Naturally occurring iron, manganese, and arsenic are the most common treatment problems in groundwater systems. Storage and spills of fuel, along with wastewater disposal, primarily from onsite (septic) systems, are common threats to groundwater quality statewide. Additionally, a range of other activities have potentially or actually affected groundwater quality (e.g., nonpoint source pollution in urban areas, natural resource extraction in remote locations, and a wide range of potential point sources of pollution).

Prevention of human exposure to contaminated groundwater is a main focus of the DEC Contaminated Sites and Leaking Underground Storage Tanks Programs, which remedy new and historical contamination resulting from leaking underground fuel tanks and other releases of oil and hazardous substances. Cleanup and remediation efforts have been ongoing since the late 1980s. Groundwater is known to be contaminated at 1,330 sites. Cleanup of groundwater is a lengthy process and is the biggest constraint to complete closure of most contaminated sites. During the cleanup, primary efforts are focused on preventing use of the water for drinking and to monitor the status of contamination. Alaska contaminated sites include seven Superfund sites where cleanups have been under way for a number of years.

**Cost of Contamination:** The cost to clean up (remediate) contaminated groundwater can be staggering; costs typically can run into millions of dollars, depending on site conditions. Installing and operating groundwater remediation equipment and long-term groundwater monitoring are common expenses during remediation. DWP and ARWA staff are coordinating DWP activities to provide education to

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communities. The education is intended to communicate the savings realized when contamination is prevented.

**Efforts to Protect Groundwater:** Protection of Alaska's groundwater is largely accomplished through the regulation of contaminated sites, storage tanks, spill response, and specific waste disposal activities under state and federal programs. DEC manages several programs that contribute to the protection of groundwater, including the following: Contaminated Sites, Storage Tank, Prevention & Emergency Response, Industry Preparedness & Pipeline, Solid Waste, Pesticides, Drinking Water, Wastewater, Water Quality, and Facilities. Additionally, ARWA staff, the EPA Underground Injection Control Program, and several other important EPA programs promote the protection of groundwater quality in Alaska.

**Division of Water:** Although Water Quality Programs of the Division of Water are focused primarily on surface water pollution, they are also protective of groundwater because surface water quality can have an impact on groundwater quality through infiltration and percolation. Division activities that protect groundwater quality include the industrial, domestic, and onsite domestic wastewater permitting programs; water quality protection, stewardship, and restoration projects implemented by the Division or funded through the ACWA grant program; and development of water body recovery plans and TMDL assessments.

The Facilities Section of the Division of Water funds the Village Safe Water Program, which provides grants and engineering assistance to small communities for water, sewer, and solid waste disposal projects. Through the Municipal Matching Grants and Loans (MMG&L) Program, the Facilities Section administers the Alaska Clean Water Fund and the Alaska Drinking Water Fund, which provide loans and engineering support for drinking water, wastewater (sewer), solid waste, and nonpoint source pollution projects, such as waterbody restoration and recovery. These loan programs are designed for cities, boroughs, and qualified private utilities. The Alaska Municipal Water, Sewerage, and Solid Waste Matching Grant Program primarily assists the larger communities and boroughs in Alaska.

**Wetlands**

The National Wetlands Inventory of USF&WS estimates that the State of Alaska includes 63% of the nation's wetland ecosystems. Activities in these wetlands and their associated waters are regulated under federal and state law and local ordinances because these ecosystems have been shown to perform vital and valuable physical, chemical, and biological functions. Alaska's wetlands function to support the state's diverse human communities, fish and wildlife populations, water resources, and economy.

In addition to being valuable, Alaska's wetlands are highly variable. They include salt and fresh water areas influenced by tides, temperate rain forests, bogs, moist and wet tundra, extensive rivers and streams, large river deltas, and vast areas of black spruce forested wetland. Table F-2 provides a summary of the estimated wetland acreage based on the National Wetlands Inventory.

<b>Table F-2      Estimated Wetland Acreage</b>
<b>Alaska's Wetlands by Major Category with Common Examples</b>

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Wetland Category <sup>a</sup>	Common Examples	Estimated Acres
Palustrine	All non-tidal wetlands: muskegs, bogs, forested wetlands, tundra, open water	172,503,400
Estuarine	Bays, salt marshes, beaches	2,131,900
Marine Intertidal	Ocean shoreline	48,600
<b>Total Wetlands</b>		<b>174,683,900</b>
<sup>a</sup> Source: USF&WS, Cowardin <i>Classification of Wetlands and Deepwater Habitat</i> , 1979		

Although Alaska does not have any wetland-specific WQS and neither numeric nor narrative qualitative criteria are specific to wetlands, the Alaska WQS (18 AAC 70) consider wetlands as “waters of the state”; consequently, Alaska’s WQS apply to wetlands.

### Wetland Trends

The 174,683,900 acres of wetlands in Alaska compose approximately 43% of state surface area. By comparison, the entire remainder of the United States contains 103 million acres of wetlands, representing approximately 5% of the surface area. About half of all Colonial-era wetland acreage in the lower 48 states has been converted to agriculture, development, or other land uses. Although there is no statistically reliable data on statewide wetland losses, USF&WS estimates that Alaska has lost 200,000 acres, or less than 1% of the state’s original wetland acreage.

In urbanized and developed areas of Alaska, such as Anchorage, more than 50% of the wetlands have been developed. Significant percentages of wetlands in other urbanized areas, including Juneau, Fairbanks, the Matanuska-Susitna Valley, and the North Slope, have been lost or affected. Because there is a strong correlation between waterbodies that are listed as impaired by DEC and areas where wetlands have been affected or developed, wetlands need restoration and mitigation of impacts associated with development. Wetlands also need protection. Specifically, wetland functions need to be maintained to enhance or protect water quality for drinking water, spawning, and other uses.

### Wetlands Management and Functional Assessment

As the lead state agency for wetland issues, DEC has developed a strategy for managing wetlands that consists of the following major activities:

- Permitting and inspections
- Use of a functional assessment and classification system (the hydrogeomorphic approach)
- Assistance to local government and tribal organizations for wetland protection and mitigation efforts

### Permitting and Inspections

DEC participates in the management and protection of wetlands by reviewing and certifying USACE dredge and fill permits under the authority of CWA Section 401. This review and certification ensures that construction and other activities do not exceed Alaska’s WQS. The Alaska District of USACE completes more than 1,000 permit actions per year.

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For the past 3 years, DEC has reviewed individual USACE dredge and fill permits using a risk-based priority system. Under this system, DEC waived its right to certify permits for 50% of the projects that were reviewed. Approximately 50% of projects were certified with or without stipulations that ensure the project will meet Alaska's WQS.

In addition, DEC reviews preconstruction notifications of USACE GP verifications that do not require a Section 401 certification on a project-by-project basis.

### Functional Assessment and Classification

To ensure that Alaska's wetlands are managed wisely, wetland professionals and policy makers need a regionally based, scientifically valid, consistent, and efficient functional assessment tool. DEC recognized that an assessment tool was needed to help managers and users recognize and distinguish between (1) naturally variable conditions and changes in the functioning of Alaska's wetlands and (2) changes that result from human activities. In response to this need, in 1996 DEC initiated a broad-based, statewide effort to develop a functional assessment approach for Alaskan wetlands.

The hydrogeomorphic approach was selected by DEC and other cooperating agencies and organizations because it offers a rapid and reference-based method of assessment that allows users to recognize human-induced changes in the functions of wetland ecosystems. Guidebooks have been developed to implement the hydrogeomorphic approach to assessment and management of wetlands in various regions of Alaska. Table F-3 identifies areas for which the use of guidebooks has provided an assessment tool to begin or complete wetland permitting and planning activity.

**Table F-3 Wetland Assessment Activity**

Regions Covered by Guidebooks	Wetland Classes	Time Frame
Interior	Flats	Completed (1999)
Cook Inlet Basin (including Kenai River Watershed)	Slope/Flats Complexes	Completed (2003)
Coastal Southeast and Southcentral	a. Riverine b. Slope River Proximal	Completed (2003)
Near Shore Ecosystems of Southeast and Southcentral	Tidal Fringe	Initiated, discontinued until further notice
Cook Inlet Basin (including Kenai River Watershed)	Riverine	Site data collected, discontinued until further notice
Arctic Coastal Plain	Flats	Not initiated

### Assistance to Local Government and Native Organizations

DEC provides statewide technical assistance to local governments for permitting issues and wetland planning. Three local governments have delegated authority from USACE to manage their wetlands. Several other communities (such as the Ketchikan Gateway Borough and the City of Wrangell) are proposing new wetland planning. DEC is also assisting the City and Borough of Juneau in developing a

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Wetlands Mitigation Bank. In 2004, DEC, along with federal agencies, successfully helped the Sealaska Native Corporation develop a private mitigation bank.

**Tribal Organization Assistance with Wetland Management**

DEC assists tribal organizations with wetland and watershed planning. It has helped develop wetland work plans with a sound scientific foundation, guided by the wetland assessment guidebooks.

***Wetland Mitigation Banking***

DEC participated in developing the Southeast Alaska Regional Mitigation Banking Instrument of Sealaska Corporation. In another wetland mitigation banking effort, the Matanuska-Susitna Borough in collaboration with a private contractor has begun developing a mitigation bank for the Matanuska-Susitna Borough. DEC participated in the initial meetings and is providing technical assistance to the Mitigation Banking Review Team for the wetland functional assessment aspects of the bank.

# APPENDIX G Interpretation of the Residues Criterion in Alaska Water Quality Standards for Use in Attainment and Impairment Determinations

## RESIDUE CRITERIA

Alaska's water quality standard for *residues* is described in 18 AAC 70.020(b).

<b>PROTECTED WATER USE CLASSES AND SUBCLASSES; WATER QUALITY CRITERIA; WATER QUALITY TABLE</b>	
<b>(2) MARINE WATER USES</b>	<b>RESIDUES Floating Solids, Debris, Sludge, Deposits, Foam, Scum, or Other Residues</b>
(A) Water Supply (i) aquaculture	May not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use. May not cause detrimental effects on established water supply treatment levels.
(A) Water Supply (ii) seafood processing	May not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use; cause a film, sheen, or discoloration on the surface of the water or adjoining shoreline; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.
(A) Water Supply (iii) industrial	May not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use.
(B) Water Recreation (i) contact recreation	Same as (2)(A)(ii).
(B) Water Recreation (ii) secondary recreation	Same as (2)(A)(ii).
(C) Growth and Propagation of Fish, Shellfish Other Aquatic Life, and Wildlife	May not, alone or in combination with other substances or wastes, make the water unfit or unsafe, for the use, or cause acute or chronic problem levels as determined by bioassay or other appropriate methods. May not, alone or in combination with other substances, cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.

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(D) Harvesting for Consumption of Raw Mollusks or Other Raw Aquatic Life	May not make the water unfit or unsafe for the use; cause a film, sheen, or discoloration on the surface of the water or adjoining shoreline; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.
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The application of the water quality standard for residues for permitted facilities is established through the implementation of the narrative criteria (above) in concert with the ZOD provisions (below), also within the WQS.

The water quality criteria for residues are narrative criteria with several provisions that are subject to interpretation. As such, it is overly simplistic to characterize the residues standard as “zero discharge.” The first sentence of the criteria for most uses provides that residues “[m]ay not, alone or in combination with other substances or wastes, make the water unfit or unsafe, **for the use...**” [emphasis added] This is a “use-based” criterion—meaning, a use impairment determination must be made to trigger a water quality violation or a significant non-compliance situation.

The second sentence within the narrative criteria for some uses states that residues “may not cause a sludge, solid, or emulsion to be deposited” on the surface, bottom, or shoreline. This prohibition against deposits is the most restrictive provision of the residue criteria. But the prohibition is not treated as a zero discharge standard in all instances. For example, DEC permits ZODs under 18 AAC 70.210, mixing zones under 18 AAC 70.240–270, and variances under 18 AAC 70.200.

In addition, DEC recognizes an implied de minimus exception to the “no deposit” criterion, so that a person skipping a stone or cleaning a fish is not considered to be in violation of state law. To date, DEC has not written any guidance about the scope of that de minimus category, but rather implements it on an ad hoc basis. EPA and the courts have long recognized the inherent authority of agencies to exempt de minimus activities from the coverage of the law. For example, see *Ober v. Whitman*, 243 F.3d 1190, 1194-95 (9<sup>th</sup> Cir. 2001). DEC asserts and exercises such authority in its interpretation and implementation of the residues standard. A use impairment determination based on a narrative water quality criterion is subject to an analysis and a determination by DEC.

The residue standard applies to any residue discharge (whether permitted or unpermitted); however, one of the most prevalent applications of the residues standard is to permitted discharges of residues in marine waters from seafood processing facilities and LTFs and the authorization of ZODs for these permits.

Alaska has an explicit provision within its WQS that allows for the authorization of ZODs for residues in 18 AAC 70. 210.

Seafood processing facilities and LTFs in Alaska are typically issued ZODs in the facility’s permit for the residues discharges. Seafood processing facilities are generally issued a 1-acre ZOD and LTFs are issued a “project area” ZOD. Additionally, it is important to recognize that exceedance of a ZOD is not equivalent to impairment; rather, exceedance of 1.5 acres of continuous residues coverage is the impairment standard.

## ZONES OF DEPOSIT

### 18 AAC 70.210. ZONES OF DEPOSIT.

- (a) The department will, in its discretion, issue or certify a permit that allows deposit of substances on the bottom of marine waters within limits set by the department. The water quality criteria of 18 AAC 70.020(b) and the antidegradation requirement of 18 AAC 70.015 may be exceeded in a zone of deposit. However, the standards must be met at every point outside the zone of deposit. In no case may the water quality standards be violated in the water column outside the zone of deposit by any action, including leaching from, or suspension of, deposited materials. Limits of deposit will be defined in a short-term variance issued under 18 AAC 70.200 or a permit issued or certified under 18 AAC 15.
- (b) In deciding whether to allow a zone of deposit, the department will consider, to the extent the department determines to be appropriate,
  - (1) alternatives that would eliminate, or reduce, any adverse effects of the deposit;
  - (2) the potential direct and indirect impacts on human health;
  - (3) the potential impacts on aquatic life and other wildlife, including the potential for bioaccumulation and persistence;
  - (4) the potential impacts on other uses of the waterbody;
  - (5) the expected duration of the deposit and any adverse effects; and
  - (6) the potential transport of pollutants by biological, physical, and chemical processes.
- (c) The department will, in its discretion, require an applicant to provide information that the department considers necessary to adequately assess (b)(1)-(6) of this section. In all cases, the burden of proof for providing the required information is on the person seeking to establish a zone of deposit. (Eff. 11/1/97, Register 143)

The Zones of Deposit section states, in part, “(t)he department will, in its discretion, issue or certify a permit that allows the deposition of substances on the bottom of marine waters within limits set by the department.” The ZOD section allows the water quality criteria of 18.70.020 and the antidegradation policy of 18 AAC 70.015 to be exceeded in a ZOD.

The federal WQS regulation in Title 40, Section 131.13, of the *Code of Federal Regulations* authorizes states to have policies, including variances and ZODs, in their WQS that generally affect the application and implementation of state WQS. The rationale for allowing ZODs or variances from WQS is for a state to maintain standards that are ultimately attainable. By maintaining the standard rather than changing it, the state would ensure further progress is made in improving water quality. With the variance provision or ZOD provision, federal NPDES and state permits may be written so that

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reasonable progress is made toward attaining the standards without violating Section 402(a)(1) of the CWA.

An authorized ZOD is fairly equivalent to a mixing zone (which is also authorized in some cases for discharge permits) in that it is an area permitted to temporarily exceed the residue standard in a limited area that does not significantly degrade the quality of the waterbody as a whole or the designated uses. Permitted ZODs should be able to recover after discharges cease through biodegradation and/or recolonization of any lingering residues on the marine bottom. It is not necessarily the solids themselves that are the problem; the problem is the smothering of the benthic community. DEC would not permit a residue discharge that resulted in a permanently sterile bottom substrate resulting from toxic contaminants.

It should be noted that the residues water quality standard was identified as a high priority for a forthcoming Triennial Review of the WQS. Any outcomes from that review could result in actual changes to the criterion and possibly affect this residues policy and result in changes to the criteria for the waterbody categories.

**History of the One-Acre Threshold**

In 1985 Governor Sheffield convened the Alaska Timber Task Force to develop a common set of LTF siting criteria. The Task Force created a Technical Subcommittee that was comprised of stakeholders including EPA, USFS, USF&WS, National Marine Fisheries Service, USACE, Governor's Office, DEC, DNR Division of Forestry, ADF&G Habitat Division, United Fisherman of Alaska, representatives of the timber industry, a member of the public-at-large, and Sealaska Native Corporation. This group produced the document known as the 1985 *Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines*, more commonly known as the "LTF Guidelines."

This document establishes the interim intertidal and submarine bark accumulation threshold of 1 acre. The document states, "An interim guideline for threshold bark accumulation levels and cleanup when exceeding those levels is being used due to a lack of information. Technical data are needed to evaluate practicable threshold accumulation levels and to evaluate technical feasibility of various options for managing accumulation, such as removal or other control procedures" (C6. Bark Accumulation: Discussion: paragraph 2). Specifically, guideline C6 states:

The regulatory agency(ies) will impose an interim intertidal and submarine threshold bark accumulation level. When accumulations exceed the threshold level, cleanup – if any – will occur at the discretion of the permitting agency(ies). The interim threshold bark accumulation level is described as 100% coverage exceeding both 1 acre in size and a thickness greater than 10 cm (3.9 inches) at any point.

The LTF Guidelines include recommended criteria for selecting the location for future LTFs. The siting criteria were designed, in part, to reduce bark accumulation of LTFs. The LTF Guidelines Committee identified the 1-acre figure as an "interim threshold bark accumulation level" until additional research could be completed. The discussion section in the guidelines states:

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Through siting, transfer system selection and solid waste management, the amount of bark lost and accumulating in intertidal and submarine areas is prevented or significantly diminished. Bark accumulation is still expected to occur in some areas promoting the need for this guideline.

The Technical Subcommittee was tasked with developing LTF guidelines that “would be beneficial for all parties involved in the permitting, construction, and operation of LTFs to have a common set of criteria (guidelines) from which to work when **designing** (emphasis added) facilities and reviewing permit applications for these facilities” (Introduction, page 1, paragraph 3). The section titled The Use of Guidelines (page 2, paragraph 2) states, “The guidelines are comprehensive and may apply to any site being evaluated for LTF permits.” It was never the intent of the Technical Subcommittee for agencies to retroactively apply this threshold to existing facilities because they were located and constructed prior to adoption of the guidelines and there was no anticipated permit workload associated with existing facilities. Some of these facilities had been in operation for 20 years prior to the development of siting guidelines without any permit limits on marine accumulation. Although additional research was not completed as planned, the use of the interim 1-acre threshold level has continued to be applied routinely in most log transfer and seafood discharge permits.

**Background on General Permits for Log Transfer Facilities**

In March 2000, EPA issued two GPs for LTFs. DEC certified the EPA permits, and adopted them as state GPs; DEC implements the state GPs separately from the EPA GPs. The state issues a written authorization to the LTF owner to operate under the applicable GP after finding that the authorization is consistent with the Antidegradation Policy (18 AAC 70.015) of the Alaska WQS. The state also approves a project area-wide ZOD (18 AAC 70.210) following an assessment of the information provided by the applicant.

One of the GPs, referred to as “pre-1985” GP (AK-G70-0000), applies to shore-based LTFs that received a Section 404 permit from USACE before October 22, 1985, and never received an individual NPDES permit. The original Section 404 permits never established any limits on the discharge of bark and wood waste into the marine environment. The pre-1985 GP modified the terms of the Section 404 permits and for the first time established a permit threshold of 1 acre for accumulation of continuous cover bark for these facilities. The original 404 permits now comply with all relevant sections of the CWA. A 1-acre threshold, instead of a 1-acre permit limit, for continuous cover bark was incorporated into the permit because it was known that some pre-1985 facilities had continuous cover bark deposits greater than 1 acre. The GP requires these facilities to complete remediation planning and plan implementation.

The other GP, called the “post-1985” GP (AK-G70-1000), applies to the following classes of LTFs:

- New LTFs that have not received individual NPDES permits
- LTFs that have current individual NPDES permits and choose to seek coverage under the GP
- LTFs that have individual NPDES permits that have expired or have been administratively extended by EPA, and that wish to continue or resume operation
- Offshore LTFs and offshore LSAs that existed either before or after 1985, and that wish to continue or resume operation

## G. Residues Interpretation

Individual NPDES wastewater discharge permits issued before adoption of the two GPs contained a fixed 1-acre (not to exceed 10 cm in thickness at any point) ZOD authorized by DEC.

Bark monitoring is required annually for all permittees whose operations transfer a total of 15 million board feet or more during the life of the LTF general permit, and that are located in water depths less than 60 feet at mean lower low water. The majority of LTFs operating under an individual or general NPDES permit are required to submit to DEC and EPA an annual dive survey report documenting the nature and extent of continuous and discontinuous bark residue accumulations at their sites. LTFs transferring less than 15 million board feet of timber volume are not required to conduct annual dive surveys; however, a great majority of the LTFs are required to conduct annual dive surveys.

The two April 2004 EPA GPs for LTFs are substantially different from previous individual permits in terms of the ZODs authorized under the permits. The GPs adopted a "project area" ZOD, which recognizes and authorizes the deposition of bark residues in the project area. The project area is defined as the entire marine operating area of an LTF, either shore-based or offshore, including the following components: shore-based log transfer devices; shore-based log transfer, rafting, and storage areas; helicopter drop areas; vessel and barge loading and unloading areas; off-shore LSAs not adjacent to a shore-based LTF; bulkheads, ramps, floating walkways, docks, pilings, dolphins, anchors, buoys, and other marine appurtenances; and the marine water and ocean bottom underlying and connecting these features. The LTF operator identifies the size of the project area in the Notice of Intent or Notification. This project area usually coincides with the DNR tidelands lease area.

The state GPs also establish a 1-acre "threshold" limit for continuous, or 100%, bark cover within the project area. If that threshold is exceeded, the operator is required to submit a remediation plan to DEC, which is intended to reduce continuous bark cover to less than 1 acre. DEC must approve the remediation plan, which becomes part of the operator's state GP authorization. The purpose for establishing the project area ZOD in the GPs is to recognize that log rafting and log storage may occupy considerable area, and are expected to cause the accumulation of discontinuous bark (less than 100% cover) and trace bark (less than 10% cover). Discontinuous and trace bark are considered to have a minimal impact on marine organisms and habitat, and can occur without limit in the project area.

As a result of the 2002 final decision in the adjudication of the DEC Section 401 certification of the two EPA GPs, DEC cannot authorize facilities located on Section 303(d) impaired waterbodies to discharge under either GP. An LTF on an impaired waterbody must obtain an individual state wastewater permit. As part of LTF permitting, DEC conducts an anti-degradation review and finding, and makes all findings required under the ZOD regulations for each facility applying for residue discharge authorization.

### **Application of Zones of Deposits for Residues to Seafood Processing Facilities**

As described above, the 1-acre ZOD in permits had its initial application through the LTF Guidelines for new facilities in the 1980s. EPA consequently adopted the 1-acre threshold as a compliance limit in NPDES permits for LTFs and the EPA NPDES GP for seafood processors (AK-G52-0000) in the mid-1990s.

## G. Residues Interpretation

In 2001, DEC again certified a ZOD of 1.0 acre when this EPA GP for nearshore and shore-based seafood processing facilities was renewed. Currently this GP authorizes approximately 235 processors. Historically, this seafood GP specified that nearshore and shore-based facilities implement a seafloor monitoring program to ensure compliance with the WQS for settleable residues in marine waters.

It should be noted that individual NPDES seafood permits have authorized residues deposits greater than the 1-acre threshold found in the AK G52-0000 seafood GP. For example, in the mid-1990s DEC issued a Section 401 certification for a 2-acre ZOD for an outfall associated with a seafood processing facility, based on the bathymetry of the bay. For seafood facilities with individual NPDES permits, a case-by-case determination of an acceptable ZOD size for residues has been the approach used since 1987.

The agencies have historically made a distinction between newly permitted sites and existing permitted sites in arriving at an allowable ZOD size determination.

### Reporting of Dive Survey Acreages

Previous reports of the actual acreage of bark coverage observed in dive surveys and listed in Alaska's 1998 Section 303(d) report could lead the public to believe that all reported continuous cover was a violation of permit conditions or of the Alaska WQS. For example, an LTF with 3.1 acres of continuous bark coverage is actually 2.1 acres over the 1-acre ZOD threshold for continuous bark coverage. Hence, the 1998 303(d) listing narrative might have stated that "dive survey information from November 1997 demonstrates a significant exceedance of the interim threshold bark accumulation level at 3.1 acres of bottom coverage."

In Alaska's Integrated Reports, DEC reports dive survey acreages as "exceedances over the one acre ZOD threshold." For example, "the dive survey information from November 2001 demonstrates an exceedance of 2.1 acres above the permitted bark accumulation level of continuous bark coverage of 1.0 acre." This reporting approach more accurately portrays actual exceedances of the permitted threshold. The level of timber harvest is significantly lower than in the past. Reduced loading associated with reduced volume transferred is likely to act to reduce continuous cover accumulation over time. Limited research to determine the effect of transfer method and volume transferred on bark accumulation has established a weak statistical correlation between volumes transferred and bark accumulation. A similar correlation has not been established for the transfer method. As described above, the 1-acre ZOD in permits had its initial application through the LTF Guidelines for new facilities in the 1980s. EPA consequently adopted the 1-acre threshold as a compliance limit in NPDES permits for LTFs and the EPA NPDES GP for seafood processors (AK-G52-0000) in the mid-1990s.

### Criteria for Waterbody Categories

DEC is not proposing to re-categorize waterbodies previously determined to be impaired for residues associated with LTFs simply because the GPs incorporate a project area ZOD. The basis for placing waters impaired by bark residues on the 303(d) list in 1998 was the 1-acre ZOD established in individual NPDES permits. For LTFs in Alaska authorized under the new GPs, the threshold limit for continuous-cover bark in the GPs remains 1 acre. The project area ZOD effectively applies to continuous, discontinuous and trace bark. The project area ZOD could be a basis for Section 303(d) listing only if significant deposits of bark and wood debris were documented outside of the project area.

## G. Residues Interpretation

For waterbodies associated with LTFs or seafood processing, dive survey protocols and reporting should be in accordance with the requirements contained in the appropriate permits.

In making attainment determinations on waters associated with an LTF and where DEC has received a Notification or Notice of Intent to Operate under a General Permit, DEC makes its categorization decision after evaluating the sufficiency and credibility of the dive survey data on file and required under the GPs and the information provided in the Notice of Intent.

### Category 1 Waterbody

Category 1 waterbodies are waters attaining water quality standards. Waterbodies are placed in this category if data support a determination that the WQS and all of the uses are attained.

Waterbodies are placed in this category when water quality data and information show that all uses are being attained.

### Category 2 Waterbody

Category 2 waterbodies are those waters that are attaining some designated uses and for which insufficient or no data and information are available to determine whether remaining uses are attained:

A waterbody is placed in Category 2 if a determination is made that the waterbody is attaining some uses or standards. Waterbodies with recent dive survey reports and for which attainment with a 1.0-acre threshold for continuous coverage of residues has been demonstrated are placed in Category 2. For a waterbody associated with residue discharge, if a facility is reporting 1 acre or less of continuous residue coverage the waterbody is placed in Category 2.

A waterbody that was determined to be impaired from residues and for which continuous coverage of residues less than 1.0 acre has been documented is placed in Category 2.

### Category 3 Waterbody

Category 3 waterbodies are waters with insufficient or no data and information to determine if any designated use is attained. Waterbodies are placed in this category if the data or information to support an attainment determination for any use is not available. Alaska has generally reliable information and data on facilities that discharge residues because of dive survey reporting requirements associated with residue discharge permits.

Supplementary data and information should be developed or monitoring should be scheduled to assess the attainment status of these waters, as needed.

### ***Criteria for Placing Waters in This Category***

Alaska's water resources include more than 3 million lakes greater than 5 acres in size, 365,000 miles of rivers and streams, more than 174,000,000 acres of fresh water wetlands, and 36,000 miles of coastal shoreline. Therefore, Alaska has a large number of waterbodies for which insufficient, inadequate, or little to no data or information exists to support attainment or impairment determinations. DEC expects

## G. Residues Interpretation

that the majority of these waters would be in Category 1 (i.e., waters attaining standards for all uses), if sufficient resources existed to assess them. Category 3 includes waters formerly known as “open files” and waters nominated for assessment through ACWA. Actions that trigger opening a file can include nomination from the public, a public complaint, a newspaper report, or more rigorous information, such as water quality reports or assessments. These waters are placed in Category 3. DEC maintains files on some of these waterbodies, which are identified in Appendix C.

### Category 4b Waterbody

Category 4b waterbodies are impaired waters but do not need TMDLs because other pollution controls in place and the waters are expected to attain WQS within a reasonable time period.

A waterbody is placed in Category 4b if LTF dive survey reports document greater than 1.5 acres of continuous residues coverage; a determination is made that the water is impaired; and there is an approved remediation plan under the LTF GPs or an individual state wastewater discharge permit. Waterbodies that are under EPA compliance orders for seafood residue violations may also be considered for placement in Category 4b.

The requirements for preparing and submitting remediation plans, taken from DEC Certificates of Reasonable Assurance for the two LTF GPs, are identified in the document *Guidance For Preparing Remediation Plans Under Alaska's General Permits For Log Transfer Facilities*. Several key details of the requirements are summarized below:

- If existing continuous bark and wood debris cover exceeds both 1 acre and a thickness of 10 cm at any point, an operator must submit a remediation plan to DEC within 120 days, unless DEC grants additional time.
- A proposed remediation plan must evaluate historical and future log transfer processes and volumes; environmental impacts of existing deposits of bark and wood debris and the environmental impacts of methods to reduce continuous coverage; and methods to reduce continuous bark coverage, including alternative methods of log transfer and transport, operational practices, and technically feasible methods and costs of removing bark.
- The remediation plan must identify a set of feasible, reasonable, and effective measures to reduce continuous bark cover to both less than 1 acre in area and 10 cm in thickness at any point.
- If removal of bark is proposed, the remediation plan must specify areas, methods, volume, and timing of removal; the method of disposal for the removed material, including practices to ensure meeting WQS; and the cost of removal by the proposed methods and alternatives considered.
- The plan must include a performance schedule and performance measures for the its implementation.
- The plan may describe measures that can be implemented in phases, with continued bark monitoring surveys and with future modification of the remediation plan based upon progress in reducing the continuous coverage.

**G. Residues Interpretation**

- DEC will approve, approve with modification, or deny a proposed remediation plan within 90 days of receipt.
- An approved remediation plan constitutes an enforceable condition of the GP.

The LTF GPs do not require EPA approval of the remediation plan. EPA requires that the LTF operator update the Pollution Prevention Plan to outline additional controls that will be implemented to reduce or eliminate additional residues accumulation. The revised Pollution Prevention Plan will not include measures intended to reduce the current bark accumulation to less than 1.0 acre.

The objective of remediation planning is to implement the most appropriate site-specific treatment with the goal of reducing the extent of continuous residues coverage to less than 1.0 acre.

**Category 5 Waterbody**

A waterbody is listed in Category 5 and on the Section 303(d) list when a determination is made that the water is impaired by residues. Category 5 waters require that a TMDL or other equivalent pollution controls are developed to attain WQS.

Section 303(d) of the CWA requires a list of waterbodies that are not expected to meet WQS without additional controls. Many Section 303(d) designated waters have not undergone comprehensive water quality assessments to determine either the extent of water quality impairment or whether existing controls are adequate to achieve the standards. DEC closely scrutinizes waterbodies to determine whether suspected water quality violations were thoroughly investigated and documented. This approach is designed to prevent the listing of waterbodies with only inconclusive or circumstantial data or observations.

For waterbodies with facilities that are permitted to discharge residues, such as a seafood processor or LTF, the impairment standard is 1.5 acres of continuous cover. If two or more consecutive dive survey reports adequately document the presence of 1.5 acres or more of continuous residue cover, the waterbody is placed on the Category 5/Section 303(d) list.

A waterbody with an LTF that has a current ZOD authorization is placed in Category 5 if two or more consecutive dive survey reports document more than 1.5 acres of continuous residues coverage and greater than 10 cm of depth at any one point, unless DEC has approved a remediation plan for that waterbody. A waterbody is placed in Category 5 when a submitter has failed to implement an approved remediation plan (LTF) according to its schedule. Exceptions may include waterbodies where ZODs were authorized at greater than 1.5 acres.

If DEC approves a remediation plan on a Category 5/Section 303(d) listed waterbody that is reporting more than 1.5 acres of continuous coverage of bark on the bottom prior to the next Section 303(d) list, the waterbody is placed in Category 4(b) in the next Section 303(d) list.

A waterbody associated with a facility operating under either of the LTF GPs that is reporting continuous coverage of residues of more than 1.5 acres is considered for Category 5/Section 303(d) listing if one of the following conditions is met: (1) the permittee failed to submit a remediation plan, or

**G. Residues Interpretation**

(2) a remediation plan has been submitted, but the permittee is failing to implement or is not meeting milestones set forth in the approved remediation plan.

A waterbody associated with an LTF where there is no currently permitted or active discharge to the water, but where the last known dive survey reported more than 1.0 acres of continuous residues coverage on the marine seafloor, is placed on the Category 5/Section 303(d) list.

A waterbody associated with a seafood processor with a current ZOD authorization with two or more dive survey reports that document more than a 1.5-acre area of seafood waste is placed in Category 5. Exemptions include waterbodies where ZODs were authorized at greater than 1.5 acres. Waterbodies with legacy site seafood piles (no current dischargers) that are determined to be more than 1 acre of continuous residue coverage may be considered for Category 5/Section 303(d) listing.

For all Category 5/Section 303(d) waterbodies listed for residues after 1998 based on two dive surveys, the operator must document through two consecutive dive surveys that the areal extent of continuous cover residues has been reduced to less than 1.5 acres to have the waterbody removed from the Category 5/Section 303(d) list. For all Category 5/Section 303(d) waterbodies listed for residues in 1998 or earlier, based on 1 acre and on one dive survey, the operator must document through one dive survey that the areal extent of continuous cover residues has been reduced to less than 1 acre in order to be removed from the Category 5/Section 303(d) list. If the areal extent of continuous cover is not declining in size, DEC will initiate permit modification or TMDL development.

The use of a greater than 1.5 acres of continuous coverage impairment standard for log transfer and seafood processing facilities with ZODs is based on several factors:

- **Permits Establish Limits, not Water Quality Standards.** The fixed 1-acre ZOD used for previous impairment determinations is a permit limit and not a water quality standard. Alaska's ZOD regulations (18 AAC 70.210) allow the deposition of substances on the bottom of marine waters within limits set by DEC. However, the standards must be met at every point outside the ZOD. Permits use the WQS as a basis for setting effluent "limits" or for allowing flexibility from the WQS.

DEC specifies the criteria that can be exceeded in a permit, short-term variance, or certification. If a discharger is granted a ZOD within a permit, the permittee can only exceed the criteria that have been identified in its permit, short-term variance, or certification.

- **Confidence of Dive Survey Information.** Although EPA NPDES individual permits contained protocols for dive surveys at LTFs, it appears that dive methods were not implemented consistently. In addition, NPDES permits included no method for calculation of bark area, which often was overestimated. These inconsistencies compared to current protocols in the GPs raise the issue of the reliability of dive survey information that resulted in previous listing decisions, and make it difficult to track trends in actual bark accumulation patterns. For instance, a 1997 dive survey on bark residues that resulted in the 1998 impairment determination and Section 303(d) listing reported the presence of measurable bark or trace coverage. The reported 9.5-acre bark footprint was based on plots with measurable bark rather than continuous-cover bark.

**G. Residues Interpretation**

The dive survey requirements contained in Seafood GPs are based on seafood waste residue dispersal patterns and seafloor monitoring. The lack of a perimeter dive survey requirement leads to uncertainty in the impairment determination.

- **Uncertainty in Current Approved Method and Acreage Calculations of Dive Survey Reports.** DEC has noted that the current required method of acreage calculation is not used correctly. As part of the dive survey review, DEC re-calculates continuous cover based on dive survey reports. For facilities that were Section 303(d) listed in 1998, DEC calculations indicate that five of the seven 2002 dive survey reports for these facilities overstated the extent of continuous cover. Of all the reports reviewed to date since the inception of the two LTF GPs, only one report understated the extent of continuous cover. Because of uncertainty about the extent of continuous cover, and by using an impairment standard of 1.5 acres of continuous coverage, DEC is confident that impairment decisions truly reflect actual impairment.
- **Natural Reduction of Residues Deposits.** Dive survey reports for LTFs that transferred little or no timber volume over a number of years often showed considerable reduction in the areal extent of continuous coverage. The reduction was likely due to natural sedimentation and/or current dispersement. For example, the areal extent of continuous bark coverage on the bottom of Corner Bay declined from 1.2 acres in 1996 to 0.6 acre in 2001. No logs were transferred during this period, and no active remediation occurred.

The level of timber harvest is significantly lower than in the past. Reduced loading associated with reduced volume transferred is likely to act to reduce continuous cover accumulation over time. Limited research to determine the effect of transfer method and volume transferred on bark accumulation has established a weak statistical correlation between volumes transferred and bark accumulation. A similar correlation has not been established for the transfer method.

- **A 1.0-Acre Accumulation Threshold and a 1.5-Acre Impairment Standard.** There is clear and pervasive language within the LTF Guidelines that establishes the 1-acre ZOD standard as a threshold standard for cleanup, and not for use as an impairment standard.
- **Impacts to the Biological Community.** The use of ZODs has been historically recognized and generally accepted for dischargers of residues to the marine environment in Alaska. The hearing officer findings, for instance, from the LTF adjudication of the DEC proposed Section 401 certifications of the two federal GPs found that the discharge of bark and wood debris sited and operated in conformity with the permit has limited and localized impacts on the benthic community within the project area. The hearing officer also asserted that such discharges would have no discernable effect on the benthic environment as a whole in the geographic area covered by the GPs. Patchy and discontinuous bark residue deposition on the bottom is authorized under the LTF GPs. Additionally, an antidegradation finding is made for each LTF facility permit.

It is recognized that excessive residue coverage of more than 1.5 acres that is continuous and in excessive depth accumulations can have adverse impacts. Facilities that are operating under permit conditions with ZODs are accepted as not adversely affecting the biological community or causing irreparable harm.

**G. Residues Interpretation**

Under the LTF GPs, exceeding the 1-acre continuous-cover threshold triggers the requirement to develop a remediation plan.

**Removal of Waterbodies from the Category 5/Section 303(d) List Determined to Be Impaired from Residues**

The following protocols are applied to all waterbodies associated with a permitted facility and Category 5/Section 303(d) listed for residues, regardless of an active discharge on site:

- For waterbodies Section 303(d) listed after 1998 and determined to be impaired for residues based on two or more dive surveys:
  - DEC requires two consecutive dive surveys documenting that continuous residues coverage is no more than 1.5 acres before the waterbody is eligible for removal from the Category 5/Section 303(d) list and for placement in either Category 1 or 2.
- For waterbodies Section 303(d) listed in 1998 or earlier (based on 1.0 acre) and determined to be impaired for residues based on one dive survey or best professional judgment:
  - DEC requires one dive survey documenting that continuous residues coverage is no more than 1.0 acre before the waterbody is eligible for removal from the Category 5/Section 303(d) list and placement in Category 1 or 2.
- In addition to consideration of the continuous residues coverage standard of 1.5 acres, DEC may consider biological assessment information, such as sediment profile imaging, in a determination to remove a water on the Section 303(d) list for residues.

H. ALASKA CLEAN WATER ACTIONS (ACWA) PRIORITY RANKING

# APPENDIX H Alaska Clean Water Actions (ACWA) Priority Ranking

The following table identifies the rankings assigned to Alaska waterbodies by the Alaska Department of Fish and Game, Alaska Department of Environmental Conservation, and Alaska Department of Natural Resources, which are abbreviated as F&G, DEC, and DNR, respectively in the table below. The final column, labeled “MAX,” identifies the agency that made the highest ranking and that ranking. Each agency ranked factors for a different component: F&G rated aquatic habitat, DNR rated water quantity, and DEC rated water quality. Additional column abbreviations are Lwr for lower and Med for medium. This table was generated in October 2009.

Waterbody Name	F&G	DEC	DNR	MAX
Akutan Harbor	Lwr	Med	Lwr	DEC Med
Anchor Pt to Happy Valley Creek	Lwr	Lwr	Lwr	F&G Lwr
Anchor River	High	High	Lwr	F&G High
Anvil Creek	High	High	High	F&G High
Auke Bay	Med	High	Lwr	DEC High
Auke Creek	Med	High	Med	DEC High
Auke Lake	Med	High	Lwr	DEC High
Auke Nu Cove	High	High	Lwr	F&G High
Auke Nu Creek	Med	Med	Lwr	F&G Med
Barabara Creek	Lwr	Lwr	Lwr	F&G Lwr
Bear Cove	Lwr	Med	Lwr	DEC Med
Bear Creek (Becharof)	Med	Med	Lwr	F&G Med
Bear Creek (Hogatza)	High	Lwr	Lwr	F&G High
Bear Creek (Homer)	Lwr	Med	Med	DEC Med
Bear Creek (Hope)	Med	Med	Med	F&G Med
Beaver Creek (Kenai)	Med	Med	Lwr	F&G Med
Beaver Inlet	Lwr	Med	Lwr	DEC Med
Beaver Lake	Med	Lwr	Lwr	F&G Med
Bell Flats	Med	Med	Lwr	F&G Med
Beluga Lake (Homer)	Lwr	Lwr	Med	DNR Med
Benny Creek	Lwr	Lwr	Lwr	F&G Lwr
Berners Bay	High	Med	Lwr	F&G High
Bidarka Creek	Lwr	Lwr	Lwr	F&G Lwr
Big Lake	High	High	Lwr	F&G High
Birch Creek (Talkeetna)	Med	Lwr	Med	F&G Med
Birch Creek, Upper Drainage	Med	High	Lwr	DEC High
Birch Lake	Med	Med	Lwr	F&G Med
Black Bear Creek	High	Med	Med	F&G High
Bodenburg Creek	High	Med	Lwr	F&G High
Bolio Lake	Lwr	Lwr	Lwr	F&G Lwr

H. ALASKA CLEAN WATER ACTIONS (ACWA) PRIORITY RANKING

Waterbody Name	F&G	DEC	DNR	MAX
Bons Creek	Med	Lwr	Med	F&G Med
Bradfield River	High	Lwr	Lwr	F&G High
Bridge Creek	Med	Med	High	DEC Med
Cabin Creek	Lwr	Lwr	Lwr	F&G Lwr
Cache Creek	Med	Med	Med	F&G Med
California Creek	Med	Med	Med	F&G Med
Campbell Creek	High	High	Lwr	F&G High
Campbell Lake	Med	High	Lwr	DEC High
Captains Bay	Lwr	High	Lwr	DEC High
Caribou Creek	Lwr	Lwr	Lwr	F&G Lwr
Carlanna Creek	High	High	Lwr	F&G High
Cedar Bay	Lwr	Lwr	Lwr	F&G Lwr
Chatanika River	Med	Lwr	Lwr	F&G Med
Chena River	High	High	Lwr	F&G High
Chena Slough	Med	High	Lwr	DEC High
Cheney Lake	High	High	Lwr	F&G High
Chester Creek	High	High	Lwr	F&G High
Chilkat River	Lwr	Med	Lwr	DEC Med
China Poot Bay	Lwr	Med	Lwr	DEC Med
China Poot Creek	Lwr	Med	Lwr	DEC Med
Chuitna River	High	High	Lwr	F&G High
Clear Creek	Lwr	Med	Med	DEC Med
Clearwater Creek	High	High	Lwr	F&G High
Clearwater Lake	Lwr	Lwr	Lwr	F&G Lwr
Cold Bay	Lwr	High	Lwr	DEC High
Colleen Lake	Lwr	Lwr	Lwr	F&G Lwr
Colville River/Umiat Lake	Lwr	Lwr	Lwr	F&G Lwr
Connors Lake	Med	Med	Lwr	F&G Med
Cooper Creek	High	Lwr	Lwr	F&G High
Copper River	High	High	Lwr	F&G High
Corner Bay	Lwr	Med	Lwr	DEC Med
Cottonwood Creek	High	High	Lwr	F&G High
Cottonwood Lake	High	Med	Lwr	F&G High
Crab Bay	Lwr	Med	Lwr	DEC Med
Crooked Creek	Med	High	Lwr	DEC High
Crow Creek	Med	Med	Med	F&G Med
Cube Cove	Lwr	Med	Lwr	DEC Med
Dark Lake	Med	Lwr	Lwr	F&G Med
Deep Creek	High	High	Lwr	F&G High
Deshka River (Kroto Creek)	High	High	Lwr	F&G High
Diamond Creek	Lwr	Lwr	Lwr	F&G Lwr
Dog Salmon Creek	Med	Med	Lwr	F&G Med
Dogfish Bay (Koyuktolik Bay)	Lwr	Lwr	Lwr	F&G Lwr
Dora Bay	Lwr	Med	Lwr	DEC Med
Dora Lake	Med	Med	Lwr	F&G Med
Duck Creek	Med	High	High	DEC High
Dutch Harbor	Lwr	High	Lwr	DEC High
Eagle River	Med	High	Lwr	DEC High

H. ALASKA CLEAN WATER ACTIONS (ACWA) PRIORITY RANKING

Waterbody Name	F&G	DEC	DNR	MAX
Eagle River Flats	Lwr	Med	Lwr	DEC Med
East Creek	Lwr	Lwr	Med	DNR Med
East Port Frederick	Lwr	High	Lwr	DEC High
Egegik River	Med	High	Lwr	DEC High
Eklutna River	Med	Med	High	DEC Med
Eldred Passage	Lwr	Lwr	Lwr	F&G Lwr
Elfin Cove	Med	Med	Lwr	F&G Med
English Bay River	Lwr	Lwr	Lwr	F&G Lwr
Eskimo Creek	Lwr	Lwr	Lwr	F&G Lwr
Eyak Lake	Med	High	Lwr	DEC High
Falls Creek	Lwr	Lwr	Lwr	F&G Lwr
Falls Creek (Gustavus)	Lwr	Med	Lwr	DEC Med
Falls Creek (Kachemak)	Med	Lwr	Med	F&G Med
Finger Lake	Lwr	Med	Lwr	DEC Med
Fire Cove	Lwr	Med	Lwr	DEC Med
Fire Lake	Lwr	Lwr	Lwr	F&G Lwr
Fish Creek (Anchorage)	Med	High	Lwr	DEC High
Fish Creek (Wasilla)	Med	Med	High	DEC Med
Fortymile	Med	Med	Med	F&G Med
Fox River	High	Med	Lwr	F&G High
Freshwater Creek	Med	Lwr	Lwr	F&G Med
Fritz Creek	High	Med	High	F&G High
Fubar Creek	Lwr	Med	Lwr	DEC Med
Funny River	High	Med	Lwr	F&G High
Furrow Creek	Lwr	High	Lwr	DEC High
Garrison Slough	Lwr	Lwr	Lwr	F&G Lwr
Gastineau Channel	High	Med	Lwr	F&G High
Gibson Cove	Lwr	Med	Lwr	DEC Med
Glacier Creek	High	High	Lwr	F&G High
Goldstream Creek	High	High	Lwr	F&G High
Goodnews River	Med	Med	Lwr	F&G Med
Goose Bay	Med	Lwr	Lwr	F&G Med
Goose Creek	Lwr	Lwr	Med	DNR Med
Goose Lake	Lwr	Med	Lwr	DEC Med
Granite Creek	High	High	Lwr	F&G High
Greens Creek	Lwr	Lwr	Lwr	F&G Lwr
Gulkana River (Lower River)	Lwr	High	Lwr	DEC High
Gulkana River (upper)	Med	High	Lwr	DEC High
Gunnuk Creek	Med	High	Lwr	DEC High
Halibut Cove	Med	High	Lwr	DEC High
Hamilton Bay	Lwr	Med	Lwr	DEC Med
Hammer Slough	Med	Med	Lwr	F&G Med
Harding Lake	Med	Lwr	Lwr	F&G Med
Harris River	Lwr	Lwr	Lwr	F&G Lwr
Hatchery Creek	Med	High	Lwr	DEC High
Hawk Inlet	Med	Lwr	Lwr	F&G Med
Herring Bay Creek	High	High	Med	F&G High
Hideaway Lake	Lwr	Lwr	Med	DNR Med

H. ALASKA CLEAN WATER ACTIONS (ACWA) PRIORITY RANKING

Waterbody Name	F&G	DEC	DNR	MAX
Hoadley Creek	High	High	Lwr	F&G High
Hobart Bay	Lwr	Med	Lwr	DEC Med
Hogatza River	Med	Med	Lwr	F&G Med
Homer Harbor	Med	High	Lwr	DEC High
Hood/Spennard Lake	Lwr	High	Lwr	DEC High
Horseshoe/Island Lakes	Med	Med	Lwr	F&G Med
Hospital Lake	Lwr	Lwr	Lwr	F&G Lwr
Iliamna Lake	Med	High	Lwr	DEC High
Iliuliuk Bay	Lwr	High	Lwr	DEC High
Iliuliuk Harbor	Lwr	High	Lwr	DEC High
Indian River	High	High	High	F&G High
Jakolof Bay	Lwr	Med	Lwr	DEC Med
Jewel Lake	Med	High	Lwr	DEC High
Jim Creek	High	High	Lwr	F&G High
Jim Lake	High	Med	Lwr	F&G High
Johnson Creek	Med	Med	Med	F&G Med
Jones Lake	Lwr	Lwr	Lwr	F&G Lwr
Jordan Creek	High	High	Lwr	F&G High
Juneau Creek	Lwr	Med	Lwr	DEC Med
Kachemak Bay	Lwr	Med	Lwr	DEC Med
Kalmbach Lake	Lwr	Lwr	Med	DNR Med
Kanektok River	Med	Med	Lwr	F&G Med
Kantishna River	Lwr	Lwr	Lwr	F&G Lwr
Kasilof River	High	High	Lwr	F&G High
Kaskanak Creek	Lwr	Med	Lwr	DEC Med
Katlina River	High	High	Lwr	F&G High
Kazakof Bay	Lwr	Med	Lwr	DEC Med
Kenai River	High	High	Lwr	F&G High
Ketchikan Creek	Med	High	Lwr	DEC High
King Cove	Lwr	High	Lwr	DEC High
King Salmon Creek	Med	Lwr	Lwr	F&G Med
Kitkun Bay	Lwr	Med	Lwr	DEC Med
Klag Bay	Lwr	Med	Lwr	DEC Med
Klawock Inlet	Lwr	Med	Lwr	DEC Med
Kobuk River	Lwr	High	High	DEC High
Kodiak Landfill Creek	Lwr	Lwr	Lwr	F&G Lwr
Koktuli River - North Fork	High	Med	Lwr	F&G High
Kotzebue Lagoon	Lwr	Lwr	Lwr	F&G Lwr
Kuparuk River	High	Lwr	Lwr	F&G High
Kuskokwim River	Lwr	Med	Lwr	DEC Med
Lab (Labouchere) Bay	Med	Lwr	Lwr	F&G Med
Lake Clark	Lwr	High	Lwr	DEC High
Lake Creek	High	Lwr	Lwr	F&G High
Lake Louise	Med	High	Lwr	DEC High
Lake Lucille	Lwr	High	Lwr	DEC High
Lake McDermott	Lwr	Lwr	Lwr	F&G Lwr
Lake Otis	Med	Med	Lwr	F&G Med
Lemon Creek	High	High	Lwr	F&G High

H. ALASKA CLEAN WATER ACTIONS (ACWA) PRIORITY RANKING

Waterbody Name	F&G	DEC	DNR	MAX
Lilly Lake	Med	Lwr	Lwr	F&G Med
Little Campbell Creek	Lwr	High	Lwr	DEC High
Little Campbell Lake	Med	Lwr	Lwr	F&G Med
Little Creek (South Fork, Nome)	Lwr	Med	Lwr	DEC Med
Little Rabbit Creek	High	High	Lwr	F&G High
Little Survival Creek	Med	High	Lwr	DEC High
Little Susitna River	High	High	Lwr	F&G High
Little Tutka Bay	Lwr	Lwr	Lwr	F&G Lwr
Lookout Cove	Lwr	Med	Lwr	DEC Med
Lost and Found Lake	Lwr	Lwr	Lwr	F&G Lwr
Lower Fire Lake	Lwr	Lwr	Med	DNR Med
Lower Talarik	Med	Med	Lwr	F&G Med
Lutak Inlet	Lwr	Med	Lwr	DEC Med
Mallard Bay	Lwr	Med	Lwr	DEC Med
Margaret Bay	Lwr	Med	Lwr	DEC Med
Margaret Creek	Med	Med	Lwr	F&G Med
Mariner Creek	Lwr	Lwr	Lwr	F&G Lwr
Matanuska River	Med	High	Lwr	DEC High
McClure Bay	Med	Lwr	Lwr	F&G Med
McKinley Lake	Lwr	Lwr	Lwr	F&G Lwr
McKinzie Inlet	Lwr	Med	Lwr	DEC Med
McNeil Creek	Med	Lwr	Med	F&G Med
McRoberts Creek	Med	Med	Lwr	F&G Med
Meadow Creek	Med	High	High	DEC High
Meadow Lake	Lwr	Lwr	Med	DNR Med
Memory Lake	Med	Med	Med	F&G Med
Mendenhall River	Med	High	Lwr	DEC High
Mills Creek	Lwr	Med	Lwr	DEC Med
Minook Creek	Lwr	Med	Lwr	DEC Med
Mirror Lake	Lwr	Lwr	Med	DNR Med
Mission Lake	Med	Lwr	Lwr	F&G Med
Montana Creek (Juneau)	Med	High	Lwr	DEC High
Montana Creek (Talkeetna)	High	High	Lwr	F&G High
Moose Creek	Med	Lwr	Med	F&G Med
Moose River	Med	Lwr	Med	F&G Med
Mosquito Lake	High	High	Med	F&G High
Mud Bay (Homer)	Lwr	Med	Lwr	DEC Med
Mulchatna River	Lwr	Med	Lwr	DEC Med
Nahodka Creek	Lwr	Lwr	High	DNR High
Naknek River	Lwr	Lwr	Lwr	F&G Lwr
Nakwasina River	High	High	Lwr	F&G High
Nancy Lake	High	High	Med	F&G High
Nataga Creek	Med	Med	Lwr	F&G Med
Nearshore Beaufort Lagoon	Lwr	Lwr	Lwr	F&G Lwr
Neptune Bay	Lwr	Lwr	Lwr	F&G Lwr
Nilumat Creek	Lwr	Med	Lwr	DEC Med
Ninilchik River	Med	High	Lwr	DEC High
Nome River	High	Med	Lwr	F&G High

H. ALASKA CLEAN WATER ACTIONS (ACWA) PRIORITY RANKING

Waterbody Name	F&G	DEC	DNR	MAX
North Twin Lakes	Lwr	Med	Lwr	DEC Med
Noyes Slough	High	High	High	F&G High
Nushagak River	Med	High	Lwr	DEC High
One Mile Creek	High	High	Med	F&G High
Ophir Creek	Med	Med	Med	F&G Med
Orca Inlet	Med	Med	Med	F&G Med
Palmer Creek (Homer)	Lwr	Lwr	Med	DNR Med
Passage Canal (Whittier Harbor)	Lwr	Lwr	Lwr	F&G Lwr
Pavlof River	Lwr	Lwr	Lwr	F&G Lwr
Paxson Lake	Lwr	Lwr	Lwr	F&G Lwr
Pederson Hill Creek	Lwr	High	Lwr	DEC High
Peters Creek	Med	Lwr	Lwr	F&G Med
Peterson Bay	Med	High	Lwr	DEC High
Peterson Creek	High	High	Med	F&G High
Pile-Driver Slough	Lwr	Lwr	Lwr	F&G Lwr
Point Macartney	Lwr	Med	Lwr	DEC Med
Popof Strait	Lwr	High	Lwr	DEC High
Port Clarence	Lwr	Lwr	Lwr	F&G Lwr
Port Valdez	Lwr	Med	Med	DEC Med
Port Valdez Small Boat Harbor	Lwr	Lwr	Lwr	F&G Lwr
Potato Patch Lake	Med	Med	Lwr	F&G Med
Potter Creek	Med	Lwr	Med	F&G Med
Pullen Creek	High	High	Lwr	F&G High
Quartz Creek	High	High	Lwr	F&G High
Quartz Lake	Lwr	Lwr	Lwr	F&G Lwr
Rabbit Creek	Med	High	High	DEC High
Red Devil Creek	Lwr	Med	Lwr	DEC Med
Red Dog Creek	Lwr	Lwr	Lwr	F&G Lwr
Red Fox Creek	Lwr	High	Lwr	DEC High
Red Lake-Anton Road Ponds	Lwr	High	Lwr	DEC High
Resurrection Creek (Hope)	High	High	Lwr	F&G High
Rice Creek	Lwr	Lwr	Med	DNR Med
Rogge Creek	Lwr	Lwr	Lwr	F&G Lwr
Rowan Bay	Lwr	Med	Lwr	DEC Med
Ruby Creek	Lwr	Med	Lwr	DEC Med
Sagavanirktok River	Med	Lwr	Lwr	F&G Med
Saginaw Bay	Lwr	Med	Lwr	DEC Med
Saint John Baptist Bay	Lwr	Med	Lwr	DEC Med
Saint Paul Island Lagoon	Lwr	High	Lwr	DEC High
Salmon Creek	Med	High	High	DEC High
Salt Lake Bay	Lwr	Med	Lwr	DEC Med
Sawmill Creek (Haines)	High	High	Lwr	F&G High
Sawmill Creek (Sitka)	Lwr	Lwr	Lwr	F&G Lwr
Scheffler Creek	Lwr	Lwr	Lwr	F&G Lwr
Schulze Cove	Lwr	Med	Lwr	DEC Med
Seldovia Bay	High	High	Lwr	F&G High
Seldovia Bay (Harbor)	Lwr	Lwr	Lwr	F&G Lwr
Shaw Creek	High	High	Lwr	F&G High

H. ALASKA CLEAN WATER ACTIONS (ACWA) PRIORITY RANKING

Waterbody Name	F&G	DEC	DNR	MAX
Ship Creek-Glenn Highway Bridge Down to Mouth	High	High	Lwr	F&G High
Shoal Cove	Lwr	Lwr	Lwr	F&G Lwr
Shoal Creek	Med	Med	Lwr	F&G Med
Shoemaker Bay	Med	Med	Lwr	F&G Med
Shovel Creek	Med	Lwr	Lwr	F&G Med
Silver Bay	Lwr	High	Lwr	DEC High
Sinuk River	Med	Lwr	Lwr	F&G Med
Sitka Harbor	Med	High	Lwr	DEC High
Situk River	Lwr	High	Lwr	DEC High
Skagway Harbor	Lwr	High	Lwr	DEC High
Skagway River	High	Med	Lwr	F&G High
Slate Creek	Lwr	Med	Lwr	DEC Med
Sleepy Bay	Med	Lwr	Lwr	F&G Med
Slikok Creek	High	Med	Lwr	F&G High
Snake River	Med	Lwr	Lwr	F&G Med
Soldotna Creek	Lwr	Lwr	Lwr	F&G Lwr
Solomon River	Med	Lwr	Lwr	F&G Med
Solomon River, East Fork	High	Lwr	Lwr	F&G High
South Fork Kaktuli River	High	Med	Lwr	F&G High
South Twin Lakes	Lwr	Lwr	Lwr	F&G Lwr
South Unalaska Bay	Med	High	Lwr	DEC High
Spring Creek	Lwr	Lwr	Lwr	F&G Lwr
Stariski Creek	High	High	Lwr	F&G High
Sundi Lake	Med	Lwr	Med	F&G Med
Sunshine Cove	Lwr	Med	Lwr	DEC Med
Sunshine Creek	Lwr	Lwr	Lwr	F&G Lwr
Suqitughneq River	Lwr	Lwr	Lwr	F&G Lwr
Susitna River	Med	High	Lwr	DEC High
Sweeper Cove	Med	Med	Lwr	F&G Med
Sweeper Creek	High	Med	Lwr	F&G High
Taku River	Med	Lwr	Lwr	F&G Med
Talkeetna River	Med	High	Lwr	DEC High
Tanana River	Lwr	Lwr	Lwr	F&G Lwr
Thorne Bay	Lwr	High	Lwr	DEC High
Thorne River Estuary	Med	Lwr	Lwr	F&G Med
Tisuk River	Med	Lwr	Lwr	F&G Med
Tolstoi Bay	Lwr	Med	Lwr	DEC Med
Tongass Narrows	Lwr	High	Lwr	DEC High
Town (Trout) Lake	Lwr	Lwr	Med	DNR Med
Troutman Lake	Lwr	Lwr	Lwr	F&G Lwr
Turnaround Creek	Med	Med	Lwr	F&G Med
Tuxedni Bay	Lwr	Med	Lwr	DEC Med
Twelvemile Arm	Lwr	Med	Lwr	DEC Med
Twitter Creek	Lwr	Med	Lwr	DEC Med
Two Moon Bay	Lwr	Med	Lwr	DEC Med
Udagak Bay	Lwr	Lwr	Lwr	F&G Lwr
Unalaska Lake	Med	Lwr	High	DNR High

**H. ALASKA CLEAN WATER ACTIONS (ACWA) PRIORITY RANKING**

<b>Waterbody Name</b>	<b>F&amp;G</b>	<b>DEC</b>	<b>DNR</b>	<b>MAX</b>
University Lake	Lwr	High	Lwr	DEC High
Unnamed Creek (City of Kenai)	Lwr	Lwr	Lwr	F&G Lwr
Unnamed Lake (Chena Hot Springs Rd.) Two Rivers Lodge	Lwr	Lwr	Lwr	F&G Lwr
Upper Bonnie Lake	Lwr	Lwr	Lwr	F&G Lwr
Upper Fire Lake	Lwr	Lwr	Med	DNR Med
Upper Talarik Creek	High	Med	Lwr	F&G High
Vanderbilt Creek	Med	High	Lwr	DEC High
Walby Lake	Med	Lwr	Med	F&G Med
Ward Cove	Lwr	High	Lwr	DEC High
Wasilla Creek	High	High	Lwr	F&G High
Wasilla Lake	High	High	Lwr	F&G High
West Port Frederick	Lwr	Med	Lwr	DEC Med
Westchester Lagoon	Med	High	Lwr	DEC High
Whale Passage	Lwr	Med	Lwr	DEC Med
Whittier Creek	Med	Lwr	Med	F&G Med
Willow Creek	High	High	Lwr	F&G High
Winter Harbor	Lwr	Med	Lwr	DEC Med
Womens Bay	Lwr	Med	Lwr	DEC Med
Wood River	Med	High	Lwr	DEC High
Woodard Creek	Med	Med	Med	F&G Med
Wrangell Narrows	Lwr	Med	Lwr	DEC Med
Wrinkleneck Creek-Swan Lake	Lwr	Med	Lwr	DEC Med
Wulik River	Med	High	Med	DEC High
Yukon River	Lwr	Med	Lwr	DEC Med
Zinc Creek	Lwr	Lwr	Lwr	F&G Lwr

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## Guidance for Determining Water Quality Impairments from Residues

**NOTE:** The information in this section does not provide a complete description of the specific considerations for waters impaired by residues; Appendix G, (Alaska's Interpretation of the Residues Criterion with Alaska's Water Quality Standards Regarding Attainment and Impairment Determinations) should be consulted for additional detail that more fully explains the considerations.

A seafood processing or LTF in Alaska is typically issued a ZOD in its permit for the residues discharges. Exceedance of a permitted ZOD is not equivalent to impairment; rather, the impairment standard is exceedance of 1.5 acres of continuous residues coverage.

For Category 5/Section 303(d) listed waters associated with a permitted facility, if the areal extent of continuous cover is not declining in size, DEC initiates permit modification or TMDL development.

### Seafood Processing Facilities

A waterbody associated with a seafood processor that has a current ZOD authorization with two or more dive survey reports that document an area of seafood waste larger than 1.5 acres is placed in Category 5. Exceptions are waterbodies for which ZODs were authorized at greater than 1.5 acres and situations in which the facility is subject to an administrative action (such as a Compliance Order or Consent Order by Decree for residues) to ensure attainment of WQS. In the latter instance, the waterbody may be considered for placement in Category 4b. For seafood piles that are legacy sites (and not current dischargers) and that are determined to be more than 1 acre of continuous residue coverage, the affected waterbody may be considered for Category 5 listing. This exception condition occurs because at the time the contributing facility was permitted, a 1-acre impairment standard was in effect and the current 1.5-acre impairment standard had not been adopted.

### Log Transfer Facilities

A waterbody associated with an LTF that has a current ZOD authorization is placed in Category 5 if two or more consecutive dive survey reports document more than 1.5 acres of continuous residues coverage and the residue coverage is greater than 10-cm in thickness at any one point, unless DEC has approved a remediation plan for that waterbody. A waterbody associated with an LTF is placed in Category 5 when an LTF permittee has failed to implement an approved remediation plan according to its schedule. Exceptions are waterbodies for which ZODs were authorized at greater than 1.5 acre, which are considered on a case-by-case basis.

If DEC approves a remediation plan on a Category 5 listed waterbody that is reporting more than 1.5 acres of continuous coverage of bark on the bottom before preparation of the next Section 303(d)

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list, the waterbody is placed in Category 4(b). Moving a Category 5 water to Category 4b requires EPA approval.

A waterbody associated with a facility operating under either of the GPs applicable to LTFs for which continuous coverage of residues over 1.5 acres are being reported is considered for a Category 5 listing if one of the following conditions is met: (1) the permittee failed to submit a remediation plan, or (2) a remediation plan has been submitted, but the permittee is failing to implement or is not meeting milestones set forth in the approved remediation plan.

A waterbody associated with an LTF for which no currently permitted or active discharge to the water is occurring, but for which the last known dive survey reported more than 1.5 acres of continuous residues coverage on the marine seafloor, is placed on the Category 5 list.

**Removal of Waterbodies Determined to be Impaired from Residues from the Category 5 List**

The following protocols are applied to all waterbodies associated with a permitted facility and Category 5 listing for residues, regardless of whether an active discharge is occurring on site.

- In addition to consideration of the continuous residues coverage standard of 1.5 acres, DEC may consider biological assessment information, such as sediment profile imaging, in a determination to remove a water on the Category 5 list for residues.
- For waterbodies placed on the Category 5 list after 1998 and determined to be impaired for residues based on the results of two or more dive surveys:
  - DEC requires two consecutive dive surveys documenting that continuous residues coverage is no more than 1.5 acres before the waterbody is eligible for removal from the Category 5 list and for placement in Category 1 or 2.
- For waterbodies placed on the Category 5 list in 1998 or earlier (based on 1.0 acre) and determined to be impaired for residues based on the results of one dive survey or best professional judgment:
  - DEC requires one dive survey documenting that continuous residues coverage is no more than 1.0 acre before the waterbody is eligible for removal from the Category 5 list and placement in Category 1 or 2.

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## **Guidance for Determining Water Quality Impairments from Turbidity**

This listing and assessment methodology for the turbidity pollutant is not a change to the turbidity criterion within Alaska WQS; however, it does provide direction for implementing the criterion when making water quality attainment or impairment determinations.

### **Parameter-Specific Criteria**

The methodology used by Alaska to evaluate waterbodies for the turbidity criterion specified in 18 AAC 70.020(b)(12) and (24) is described below.

### **Identification of Natural Conditions**

When considering data in an impairment decision, the natural background condition, or reference condition, must be established. This first step is essential because the term “above natural conditions” is key to the criteria specified for five of the seven water uses protected from turbidity. Turbidity data collected without an established natural condition should not be considered in any impairment determination. Many of Alaska’s waters have naturally occurring turbid flows, especially glacially fed or tidally influenced waters, and care must be taken to effectively establish a natural condition for reference.

Alaska recognizes that variability in turbidity—among sites and over time—complicates the task of determining a natural or background level for any specified level of discharge.

To collect water samples, a concurrent or an “upstream, downstream” approach is preferred. This approach entails sampling to establish natural conditions. Measurements taken upstream (control/natural conditions) and downstream (treated/impacted) of a particular pollutant source are compared. It is assumed that any increase in turbidity is due to the source or activity. Because upstream sampling establishes the natural conditions, readings should be taken upstream of any suspected exceedances of the criteria and of any man-induced point or nonpoint sources of turbidity.

When it may not be feasible to establish an upstream reference condition, a “paired watershed” approach may be used. In this approach, a nearby water with similar hydrology, morphology, aspect, and other characteristics is identified for use in establishing the natural condition. The upstream, downstream approach is the preferred method, and data using this method may be weighted greater than data gathered through a paired watershed approach.

Samples taken to establish reference conditions must be collected at approximately the same time of year and during the same flows, as when samples are collected for suspected exceedances.

Because turbidity can be influenced by natural phenomena, such as storm events, sampling during or immediately after high-flow or storm events should be avoided. Low-flow, dry-period sampling also should be avoided. Any turbidity data taken during such events should be discounted. Such data would not be considered less reliable if exceedances and impairment are suspected to be persistently occurring at low-flow or high-flow storm events and to be a result of man-induced activities. For these instances, the preferred approach is to gather data at a wide range of flow events.

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**Visual Turbidity Observations**

Although visual observations of elevated turbidity observations may often be noted and signal criteria exceedances, Alaska does not make impairment determinations, and the associated Section 303(d) listings, based solely on visual turbidity observations. Visual observations often lead to identification of suspected criteria exceedances. To confirm exceedances, the results of in-water nephelometric turbidity unit (NTU) sampling are compared to an established reference condition.

**Minimum Data Requirements and Analysis**

Current data (less than 5 years old) are generally used for evaluation of turbidity, although some documentation or data more than 5 years old may be relevant. Older data are generally given less significance when reviewing information in an impairment determination.

Collection of 20 or more samples during at least three sampling events, with each sampling event separated by at least 1 week, is required to establish persistent exceedances of the turbidity criterion. Larger sample sets are desirable.

Sample locations should be reasonably distributed to avoid bias in any one sampling event. Sampling is generally obtained for at least two seasons. For example, 20 samples could be collected during the first and third weeks of May and the first week of June to make a determination.

If more than 10% of the samples exceed the turbidity criteria, the waterbody is considered for assignment to Category 5. Outliers, or results that are numerically distant from other data, are fully scrutinized, and in certain instances, such as in a clear storm event situation, they may be discounted. Outliers are viewed in "totality" of the entire data set. An impairment determination is not based on outliers alone.

The preferred method for establishing turbidity impairment is to employ the use of continuous sampling data loggers, which are capable of recording large data sets. In these instances, statistical analysis may be required.

Before a final decision to add a waterbody impaired by turbidity to the Section 303(d) list, Alaska reviews the data for the basic concepts employed in any listing, including persistence, duration, and magnitude. Tools such as enforcement and permit limitations should be evaluated for the ability to effectively reduce the exceedances.

**Removal of a Water from the Section 303(d) List for Turbidity**

The current listing methodology used by Alaska dictates that for removal of a water from the Section 303(d) list, both the level of data to support the removal determination and the burden of proof are no greater than those used in the initial Section 303(d) listing determination. For a water that was placed on the Section 303(d) list (in 2008 or earlier) for turbidity impairment based on visual turbidity observations and best professional judgment, a determination to remove the water from the Section 303(d) list may be based on visual turbidity observations and best professional judgment alone.

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## **Guidance for Determining Water Quality Attainment or Impairment from Pathogens**

Test methods for pathogens are specified in 18 AAC 70. The fecal coliform (FC) bacteria and enterococci enumeration must be determined by the membrane filter technique or most probable number procedure, according to the approved editions of *Standard Methods for the Examination of Water and Wastewater*, adopted by reference in 18 AAC 70.020(c), or in accordance with other standards approved by DEC and EPA.

Section 303(d) listing determinations must be based on a laboratory analysis with an adequate Quality Assurance Project Plan (QAPP) for any FC or enterococci samples. For non-detect samples, the laboratory minimum detection limits are used to determine the value for a geometric mean calculation.

It should be established that the FC bacteria levels are from human activities (such as septic systems, domestic animal waste) prior to any consideration of Section 303(d) listing as impaired. A waterbody is not Section 303(d) listed as impaired if it can be established that the exceedance is due to natural conditions (such as wildlife). A determination about natural conditions requires well-reasoned best professional judgment combined with information or data to validate the condition. A decision to not list a waterbody because exceedances are from natural conditions requires, at a minimum, identification of a natural source that is likely responsible for producing the exceedances and information to support the absence of human impacts or no human impacts that exceed the allowable limits. Wilderness areas or other areas with no significant human impact are assumed to represent natural conditions.

## **Guidance for Determining Water Quality Impairments from Pathogens for *Fresh Water Uses***

The numeric criteria for six fresh water uses specified in Alaska WQS for FC bacteria (18 AAC 70.020) all have an “in a 30-day period” geometric mean provision and a “not more than 10% of the samples may exceed” provision. Both provisions in the criteria must be met to attain the FC bacteria standard. (No criterion is specified for the “Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife” fresh water use.)

### **Minimum Number of Samples**

For either the 30-day “geometric mean” or the “10% of samples” provisions of the criteria, a minimum of 5 samples is required for determining attainment or impairment however 10 samples are preferred. Data sets for 30 days with fewer than 10 samples are less desirable for the purposes of making a determination of WQS attainment.

### **Assessment and Sampling Period**

At least two 30-day sampling periods during a 2-year period is desired to make attainment or impairment decisions. 10 samples in each 30-day sampling period are considered collectively to be an adequate assessment and sampling period. In each 30-day sampling period, the grouping or overlapping of samples should be avoided, and sampling preferably should be spread over the 30-day period. Data

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sets that do not have two distinct 30-day sampling periods within a 2-year period are considered insufficient for listing and delisting purposes.

Two or more samples may be taken on the same day but should not be taken at the same sampling point. A period of sampling may be established for an impairment when exceedances are dependent on seasonal temperature conditions, heavy water use periods, or both.

Sampling during a range of stream flows, if applicable, is a better representation of all conditions and can identify seasonal conditions that are problematic for FC, such as ice break-up in the spring. Sampling during peak flow events, such as spring break-up or large rain events, is not desirable because it may not represent a persistent human-caused impact. If it is deemed necessary to sample during peak flow events or spring break-up, the sample data set must contain samples collected during a range of stream flow conditions and results should be compared to other flows for comparison.

### **Approach for Determining Attainment or Impairment Caused by Fecal Coliform Bacteria for Fresh Water Uses**

The waterbody is considered impaired (e.g., persistent exceedances) when at least two 30-day sampling periods demonstrate an exceedance of either provision of the criterion over a two year period. Samples collected in two or more 30-day sampling periods are not combined; they are examined separately for comparison with the standard.

The recommended approach is that exceedances found in only one 30-day sampling be followed with an additional 30-day sampling period during the same season of the next year to validate the persistence of the water quality impairment over a two year period.

### **Guidance for Determining Water Quality Attainment or Impairment from Pathogens for *Marine Water Uses***

FC bacteria criteria are specified for six of the seven marine water uses. The numeric criteria for five uses specified in 18 AAC 70.020(b) for FC bacteria all have provisions for “in a 30-day period” and a “not more than 10% of the samples may exceed.” Both provisions must be met to attain the FC bacteria standard. (No criterion is specified for the marine water use for “Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife” marine water use.)

An FC bacteria criterion specified for the “Harvesting for Consumption Raw Mollusks or Other Aquatic Life” marine water use is different from the other five marine water uses. In addition, EPA has established additional criteria for enterococci for Alaska for the primary contact recreation use in marine waters. These criteria are discussed below.

### **Minimum Number of Samples**

For either the 30-day “geometric mean” or the “10% of samples” provisions of the criteria, a minimum of 5 samples is required for determining attainment or impairment however 10 samples are preferred in a recommended 30-day period. Data sets for 30 days with fewer than 10 samples are less desirable for the purposes of making a determination of WQS attainment or impairment.

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## **Assessment and Sampling Period**

At least two 30-day sampling periods during a 2-year period is desired. As noted earlier, 10 samples in each 30-day sampling period are considered collectively to be an adequate assessment and sampling period. In each 30-day sampling period, the grouping or overlapping of samples should be avoided, and sampling preferably should be spread over the 30-day period. Data sets that do not have two distinct 30-day sampling periods within a 2-year period are considered insufficient for listing and delisting purposes.

Two or more samples may be taken on the same day but should not be taken at the same sampling point. A period of sampling may be established for an impairment when exceedances are dependent on seasonal temperature conditions, heavy water use periods, or both.

## **Approach for Determining Attainment or Impairment Caused by Fecal Coliform Bacteria for Marine Water Uses**

The waterbody is considered impaired (e.g., persistent exceedances) when at least two 30-day sampling periods demonstrate an exceedance of either provision of the standard over a two year period. Samples collected in two or more 30-day sampling periods are not combined; they are examined separately for comparison with the standard.

## **Criterion for the “Harvesting for Consumption of Raw Mollusks or Other Aquatic Life” Marine Water Use**

The Alaska water quality standard criterion for the “Harvesting for Consumption Raw Mollusks or Other Aquatic Life” marine water use is worded as follows:<sup>2</sup>

Based on a 5-tube decimal dilution test, the fecal coliform median MPN may not exceed 14 FC/100 ml, and not more than 10% of the samples may exceed a fecal coliform median MPN of 43 FC/100 ml. Or based on a 12-tube single dilution test, the fecal coliform median MPN may not exceed 14 FC/100ml, and not more than 10% of the samples may exceed a fecal coliform median MPN of 28 FC/100 ml.

## **Minimum Number of Samples**

A minimum of 15 samples should be collected for assessing attainment of the “Harvesting for Consumption Raw Mollusks or Other Aquatic Life” use in remote areas where there is no actual or potential pollution. The collection of the water samples should generally be planned or scheduled to capture the rainy months and the dry months, as well as high- and low-tide variables. Ideally the samples capture various hydrological and meteorological conditions that might have an impact on the water quality. In addition to the water sampling, a shoreline survey is required to determine potential pollution sources on shore. A typical water classification survey for the classification of commercial shellfish growing and harvest areas takes at least 12 months. A minimum of 30 samples should be collected under

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<sup>2</sup> The abbreviations in the regulatory language are defined as follows: MPN, most probably number; FC, fecal coliform; and ml, milliliters.

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various environmental conditions in growing areas where pollution sources (human habitation or known pollution potential) may have an impact on the water quality.

## **Approach for Determining Impairment**

A waterbody is considered to not be attaining the FC bacteria standard when either provision of the standard is exceeded for the “Harvesting for Consumption Raw Mollusks or Other Aquatic Life” marine water use.

## **Criteria for Marine Water Use for Coastal Recreation Areas (Primary Contact)**

The federal Beaches Environmental Assessment and Coastal Health (BEACH) Act of 2000 specifies the following water quality criteria for coastal recreation (primary contact) in marine waters:

Geometric mean of 35 enterococci per 100 ml shall not be exceeded.

Or

A single sample maximum (per 100 ml) of 158 enterococci shall not be exceeded.

This standard was promulgated by EPA for Alaska in 2004 and published in the *Federal Register* in 69 FR 67217-67243.

## **Minimum Number of Samples Required for Attainment or Impairment for Coastal Recreation Areas**

At least two 30-day sampling periods during a 2-year period, with a minimum of five samples in each 30-day sampling period, are necessary to provide an adequate assessment and sampling period for coastal recreation (primary contact) areas in marine waters. In the 30-day period, samples should not be grouped; instead, they should be reasonably spread over the 30-day sampling period. However, two samples in one day are acceptable but should not be taken at the same sampling point. When exceedances are dependent on seasonal temperature conditions, heavy water use periods, or both, a seasonal period may be established for the impairment.

## **Laboratory Methodology for Enterococci**

The standard method (EPA Method 1600) for enterococci analysis must utilize the mEI medium or other method approved by EPA for CWA purposes.

## **Approach for Determining Impairment for the Marine Water Coastal Recreation (Primary Contact) Use Areas**

The waterbody is considered impaired (e.g., persistent exceedances) when at least two 30-day sampling periods demonstrate an exceedance of either provision of the criterion. Samples collected in two or more 30-day sampling periods are not combined; instead, they are examined separately for comparison with the standard.

***I. Supplemental Listing Methodology***

The recommended approach is that exceedances found in only one 30-day sampling be followed with an additional 30-day sampling period during the same season of the next year to validate the persistence of the water quality impairment over a two year period.